PHILIPS

Curso LC04
00. Introducción

Philips Ibérica – Electrónica de Consumo
Departamento Técnico
Cristina Senallé - Gabriel Arianes
Noviembre 2004

AGENDA

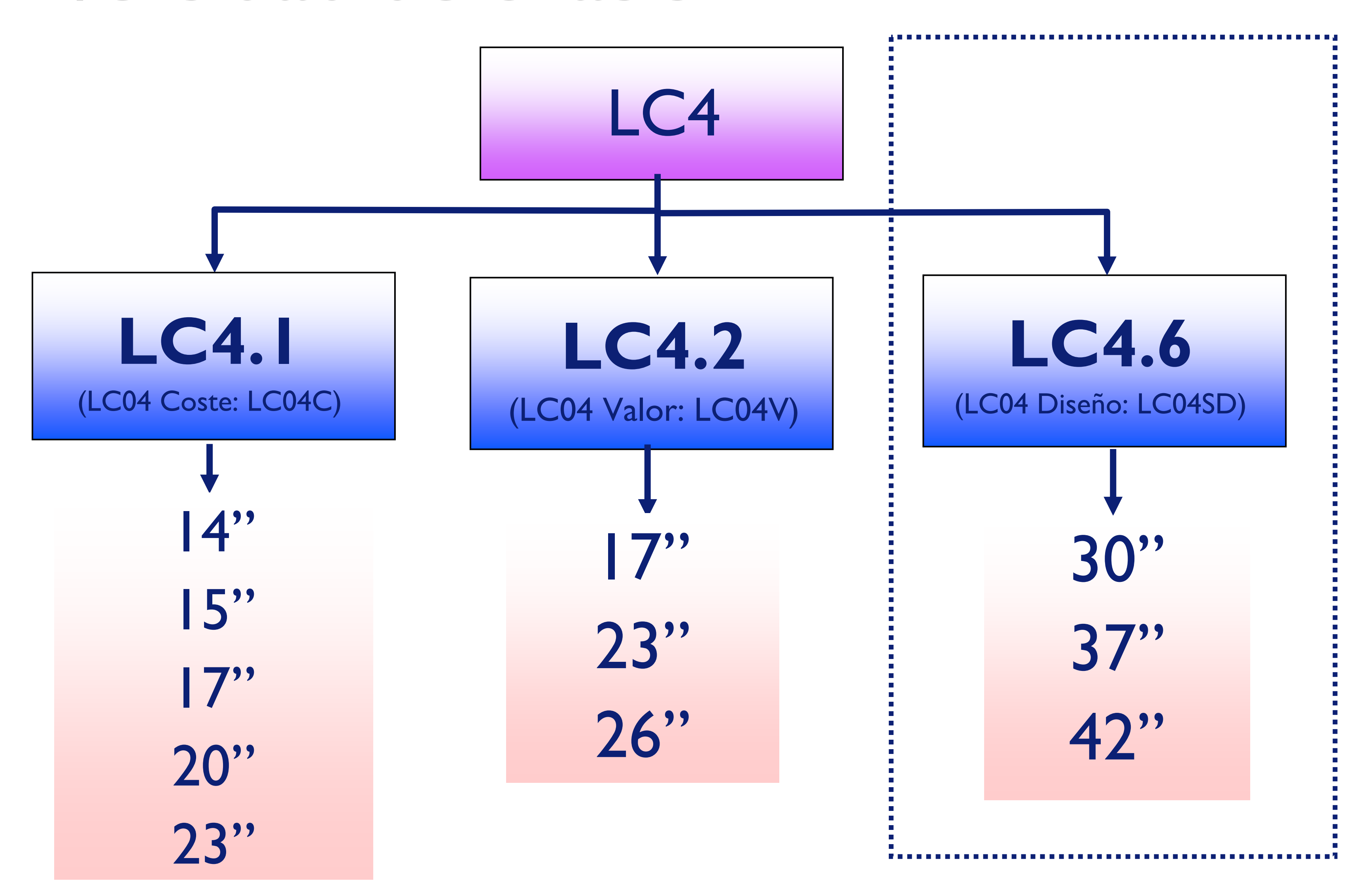


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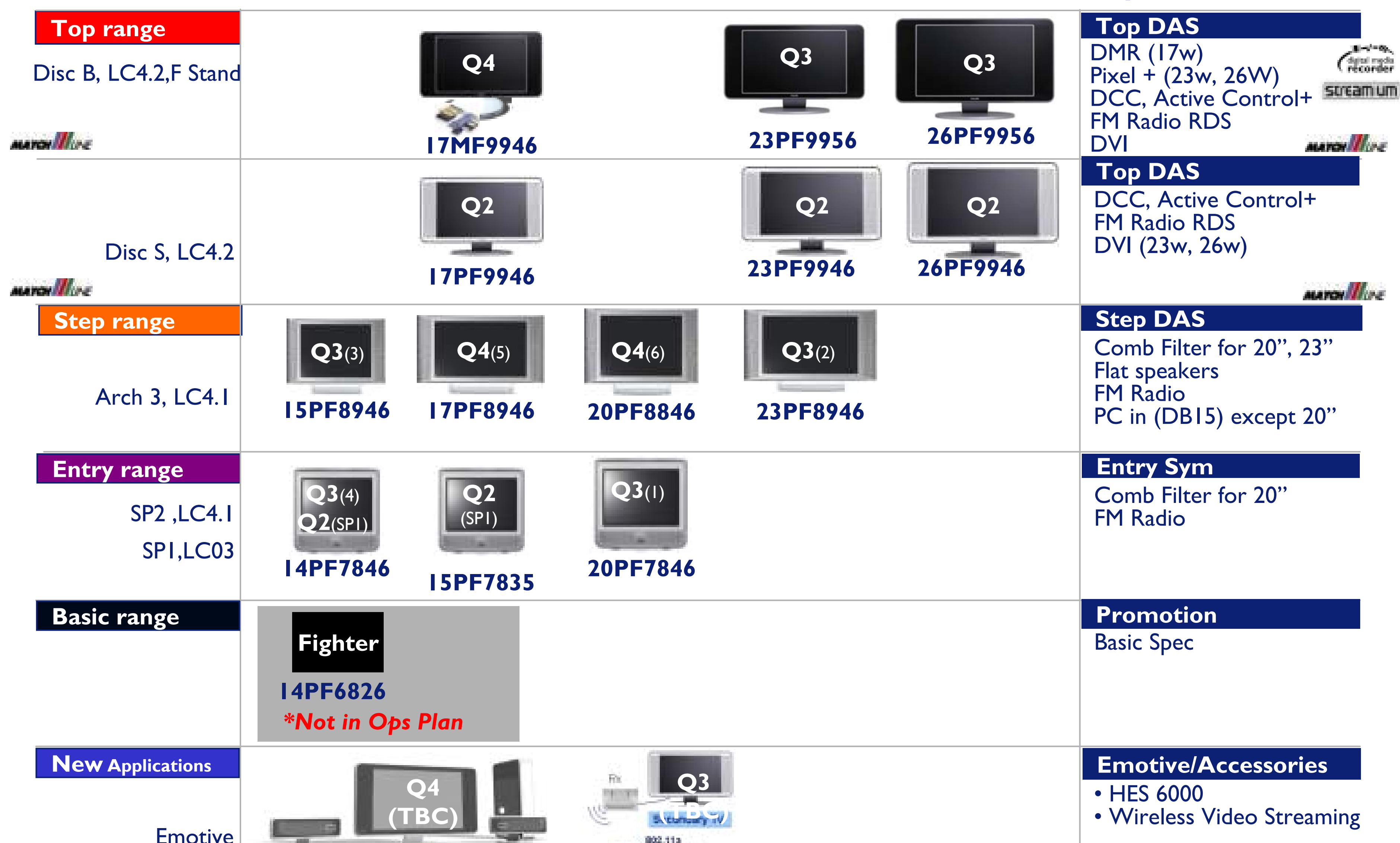
Curso LC04
01. Gama 2004

Philips Ibérica – Electrónica de Consumo
Departamento Técnico
Cristina Senallé - Gabriel Arianes
Noviembre 2004

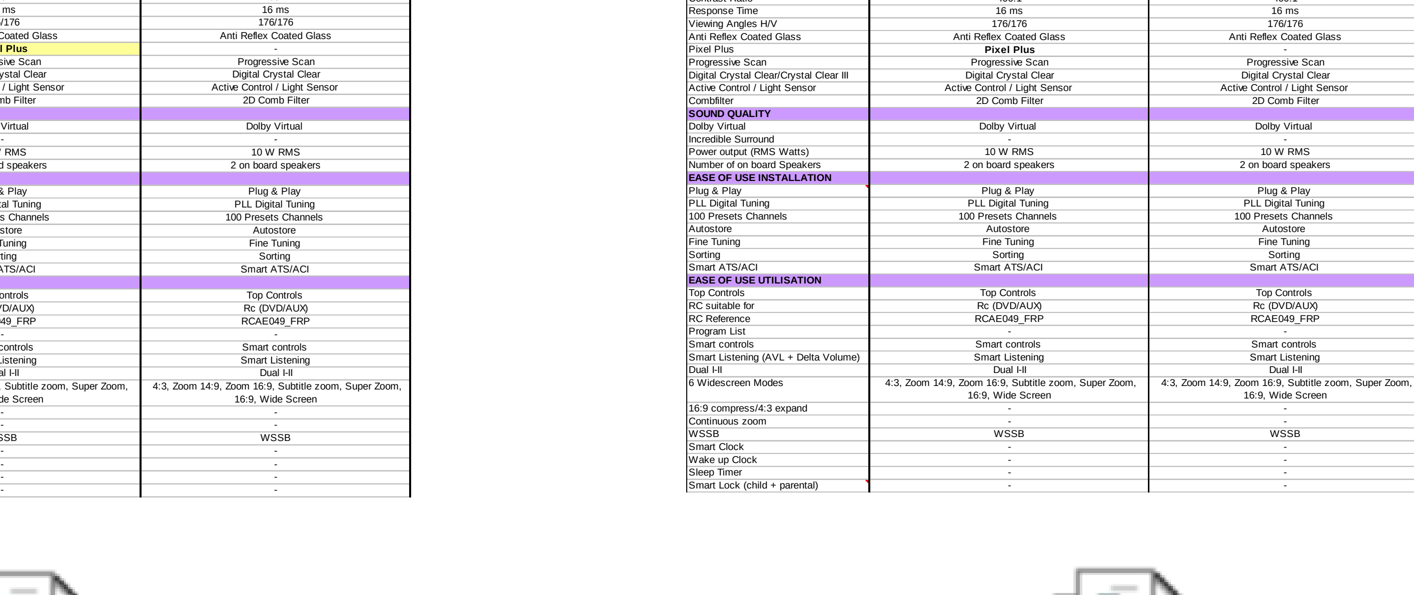
Diversidad de chasis



Gama 2004 de Flat TV



Especificaciones técnicas



	TOP	STEP
Back To List		
FLAT TV		
	LCD TV	LCD TV
Type no. Update Flat TV	26PF9956	26PF9946
Chassis	LC04 V	LC04 V
PICTURE QUALITY		
Panel	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT
Number of Pixels	1280x768 (*3)	1280x768 (*3)
Brightness	450 cd/m^2	450 cd/m^2
Contrast Ratio	400:1	400:1
Response Time	16 ms	16 ms
Viewing Angles H/V	176/176	176/176
Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass
Pixel Plus	**Pixel Plus**	-
Progressive Scan	Progressive Scan	Progressive Scan
Digital Crystal Clear/Crystal Clear III	Digital Crystal Clear	Digital Crystal Clear
Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor
Combfilter	2D Comb Filter	2D Comb Filter
SOUND QUALITY		
Dolby Virtual	Dolby Virtual	Dolby Virtual
Incredible Surround	-	-
Power output (RMS Watts)	10 W RMS	10 W RMS
Number of on board Speakers	2 on board speakers	2 on board speakers
EASE OF USE INSTALLATION		
Plug & Play	Plug & Play	Plug & Play
PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning
100 Presets Channels	100 Presets Channels	100 Presets Channels
Autostore	Autostore	Autostore
Fine Tuning	Fine Tuning	Fine Tuning
Sorting	Sorting	Sorting
Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI
EASE OF USE UTILISATION		
Top Controls	Top Controls	Top Controls
RC suitable for	Rc (DVD/AUX)	Rc (DVD/AUX)
RC Reference	RCAE049_FRP	RCAE049_FRP
Program List	-	-
Smart controls	Smart controls	Smart controls
Smart Listening (AVL + Delta Volume)	Smart Listening	Smart Listening
Dual I-II	Dual I-II	Dual I-II
6 Widescreen Modes	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen
16:9 compress/4:3 expand	-	-
Continuous zoom	-	-
WSSB	WSSB	WSSB
Smart Clock	-	-
Wake up Clock	-	-
Sleep Timer	-	-
Smart Lock (child + parental)	-	-

	TOP	STEP
Back To List		
FLAT TV		
	LCD TV	LCD TV
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Chassis	LC04 V	LC04 V
PICTURE QUALITY		
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Contrast Ratio	400:1	400:1
Response Time	16 ms	16 ms
Viewing Angles H/V	176/176	176/176
Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass
Pixel Plus	**Pixel Plus**	-
Progressive Scan	Progressive Scan	Progressive Scan
Digital Crystal Clear/Crystal Clear III	Digital Crystal Clear	Digital Crystal Clear
Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor
Combfilter	2D Comb Filter	2D Comb Filter
SOUND QUALITY		
Dolby Virtual	Dolby Virtual	Dolby Virtual
Incredible Surround	-	-
Power output (RMS Watts)	10 W RMS	10 W RMS
Number of on board Speakers	2 on board speakers	2 on board speakers
EASE OF USE INSTALLATION		
Plug & Play	Plug & Play	Plug & Play
PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning
100 Presets Channels	100 Presets Channels	100 Presets Channels
Autostore	Autostore	Autostore
Fine Tuning	Fine Tuning	Fine Tuning
Sorting	Sorting	Sorting
Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI
EASE OF USE UTILISATION		
Top Controls	Top Controls	Top Controls
RC suitable for	Rc (DVD/AUX)	Rc (DVD/AUX)
RC Reference	RCAE049_FRP	RCAE049_FRP
Program List	-	-
Smart controls	Smart controls	Smart controls
Smart Listening (AVL + Delta Volume)	Smart Listening	Smart Listening
Dual I-II	Dual I-II	Dual I-II
6 Widescreen Modes	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen
16:9 compress/4:3 expand	-	-
Continuous zoom	-	-
WSSB	WSSB	WSSB
Smart Clock	-	-
Wake up Clock	-	-
Sleep Timer	-	-
Smart Lock (child + parental)	-	-

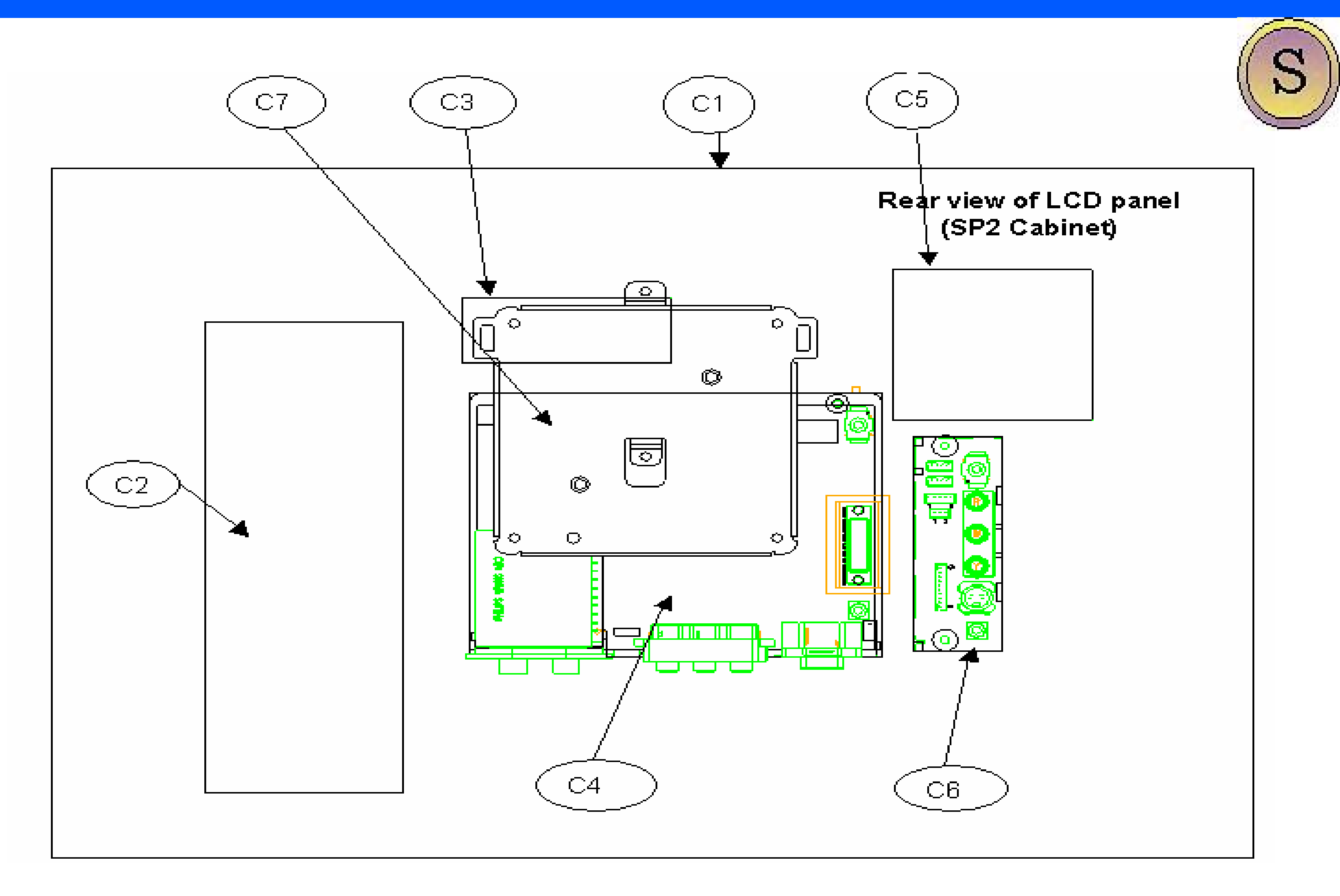




Plataforma LC4.1

Hay 2 variantes en la plataforma LC4.1 que se pueden diferenciar por el tipo de soporte, la medida de la pantalla y las características del producto.

Commercial Range	Housing	Panel Size					
		14”	15”	17”	20”	23”	
Q3-Step	Arch III		15PF8946	17PF8946	20PF8846	23PF8946	
Q2-Entry	SP2	14PF7846			20PF7846		


C7
C3
C1
C5
Rear view of LCD panel
(SP2 Cabinet)
C2
C4
C6

Tipos de muebles

En el chasis LC4.1 hay dos tipos de muebles:

- **Arch III**:
  - *Cubierta delantera*: igual que el LC03.
  - *Cubierta trasera*: adaptada para satisfacer los requisitos del chasis LC4.1.

- **SP2**:
  - *Cubierta delantera*: igual que el LC03SP.
  - *Cubierta trasera*: adaptada para satisfacer los requisitos de conectividad trasera del chasis LC4.1.

Tipos de muebles: Arch III



Tipos de muebles: SP2



Tipos de muebles: SP2

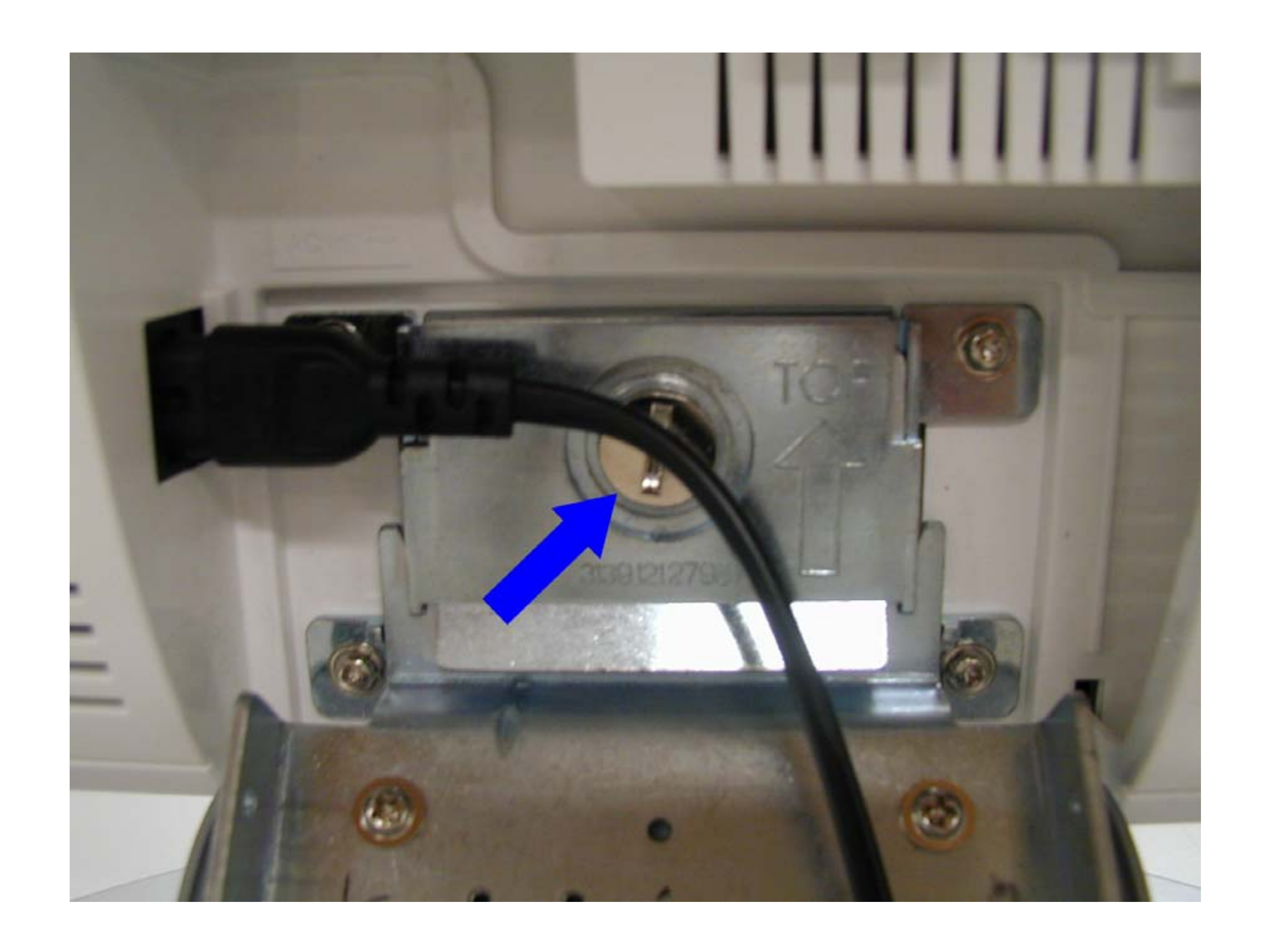
Gestión del cableado



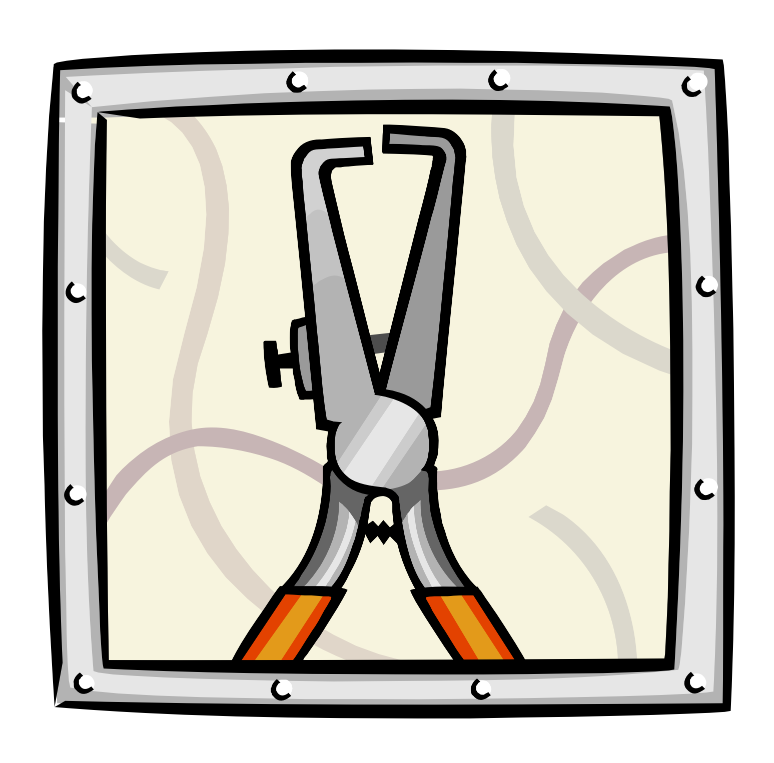


Tipos de muebles: SP2

Extracción de la base



Política de servicio



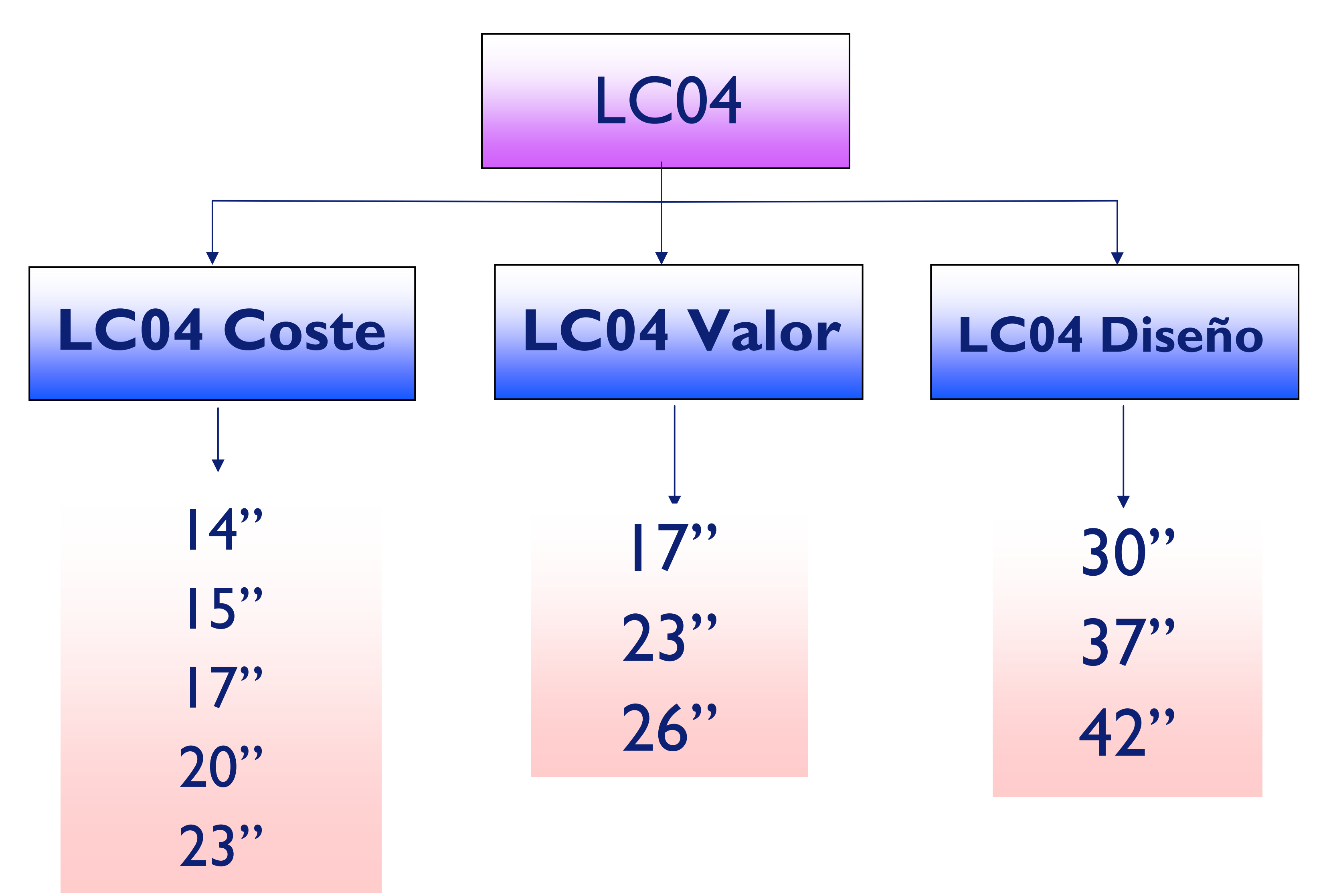
- **Pantalla**
  - ➢ Sustitución
- **Fuente de alimentación**
  - ➢ Sustitución en LC4.1 y LC4.2
  - ➢ Reparable a nivel de componentes en LC4.6
- **Placas**
  - ➢ Reparables a nivel de componentes

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Curso LC04
02. Diagrama de bloques

Philips Ibérica – Electrónica de Consumo
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Noviembre 2004

Diversidad de chasis



Panel TV-Scaler

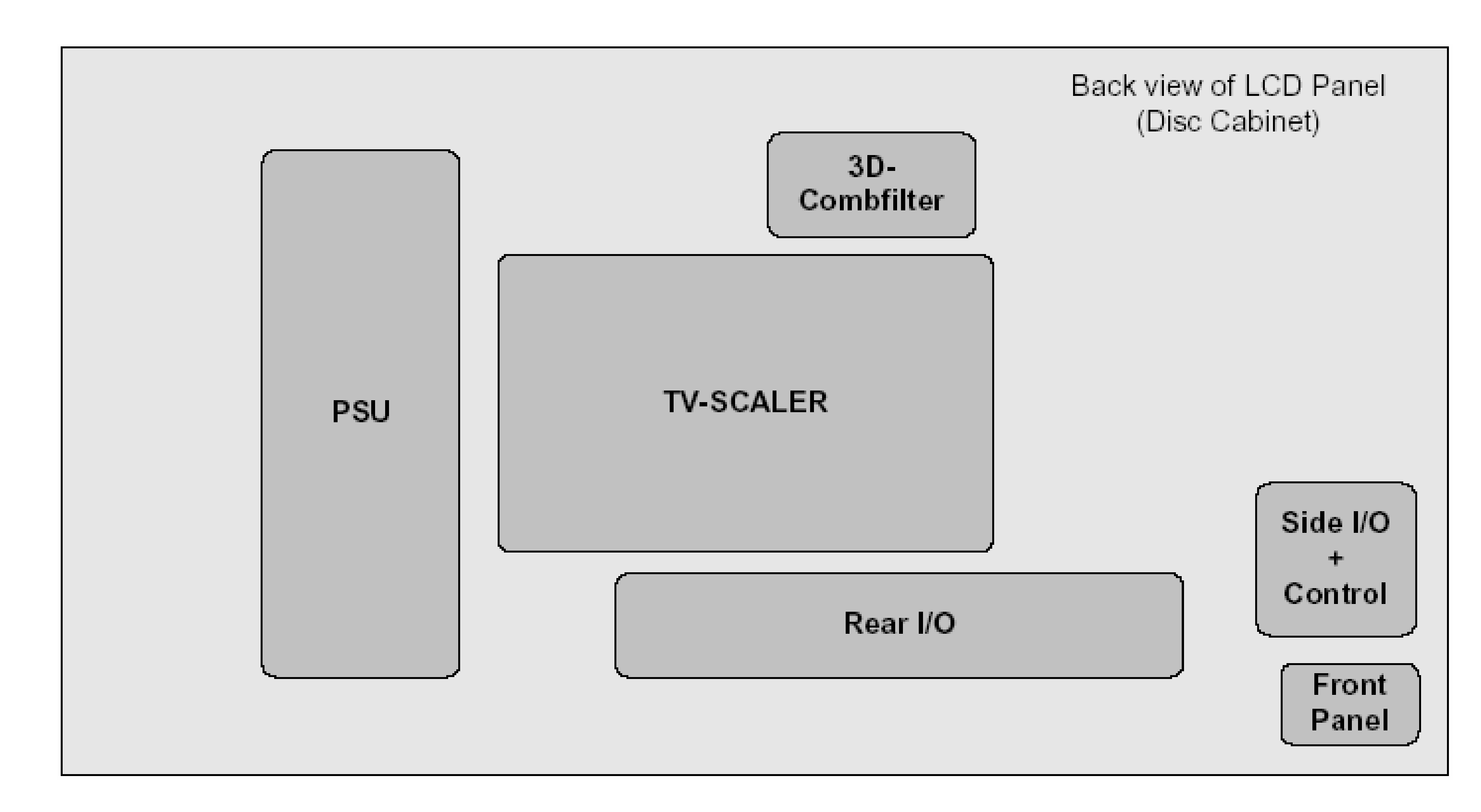
El procesador de TV y el procesador Scaler en el chasis LC4 están en la misma placa.

Para el procesador de TV se utiliza un nuevo chip denominado **Hercules**.

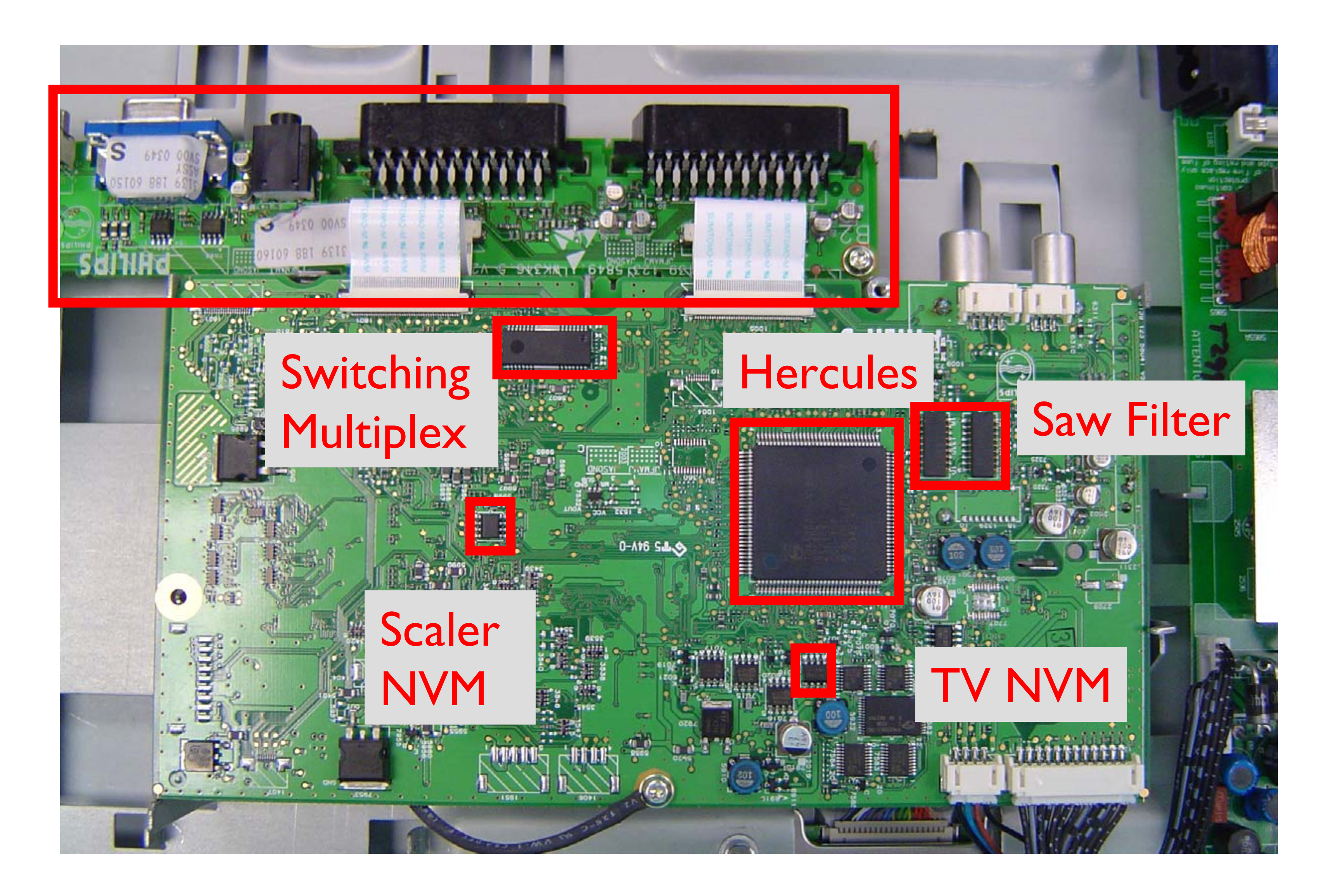
El procesador Scaler es el **GM 1501** (BGA) para los chasis LC4.2 y LC4.6 y el **GM 5221** (QFP) para el chasis LC4.1.



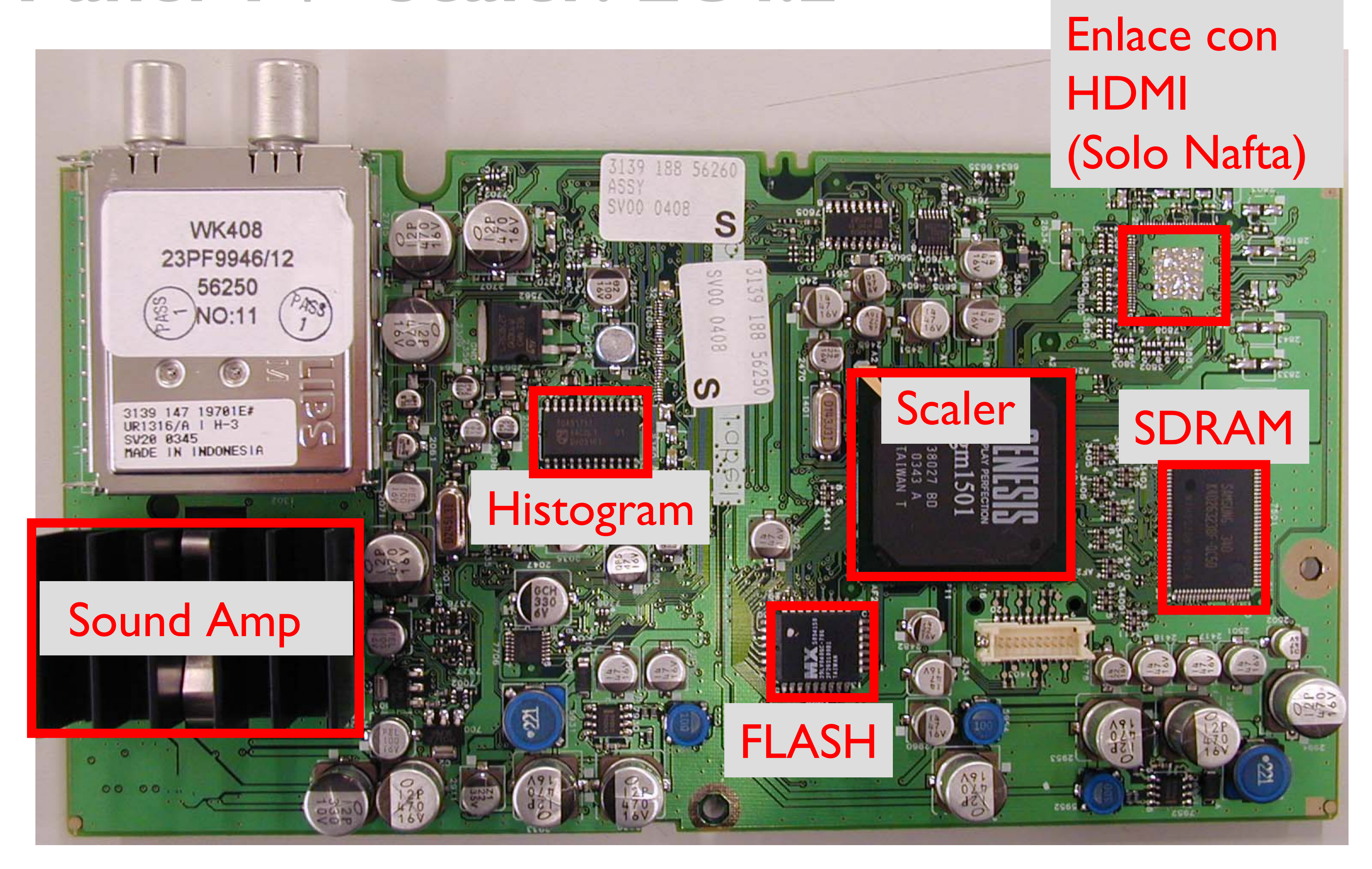
Revisión de Paneles



Panel TV- Scaler. LC4.2



Panel TV- Scaler. LC4.2

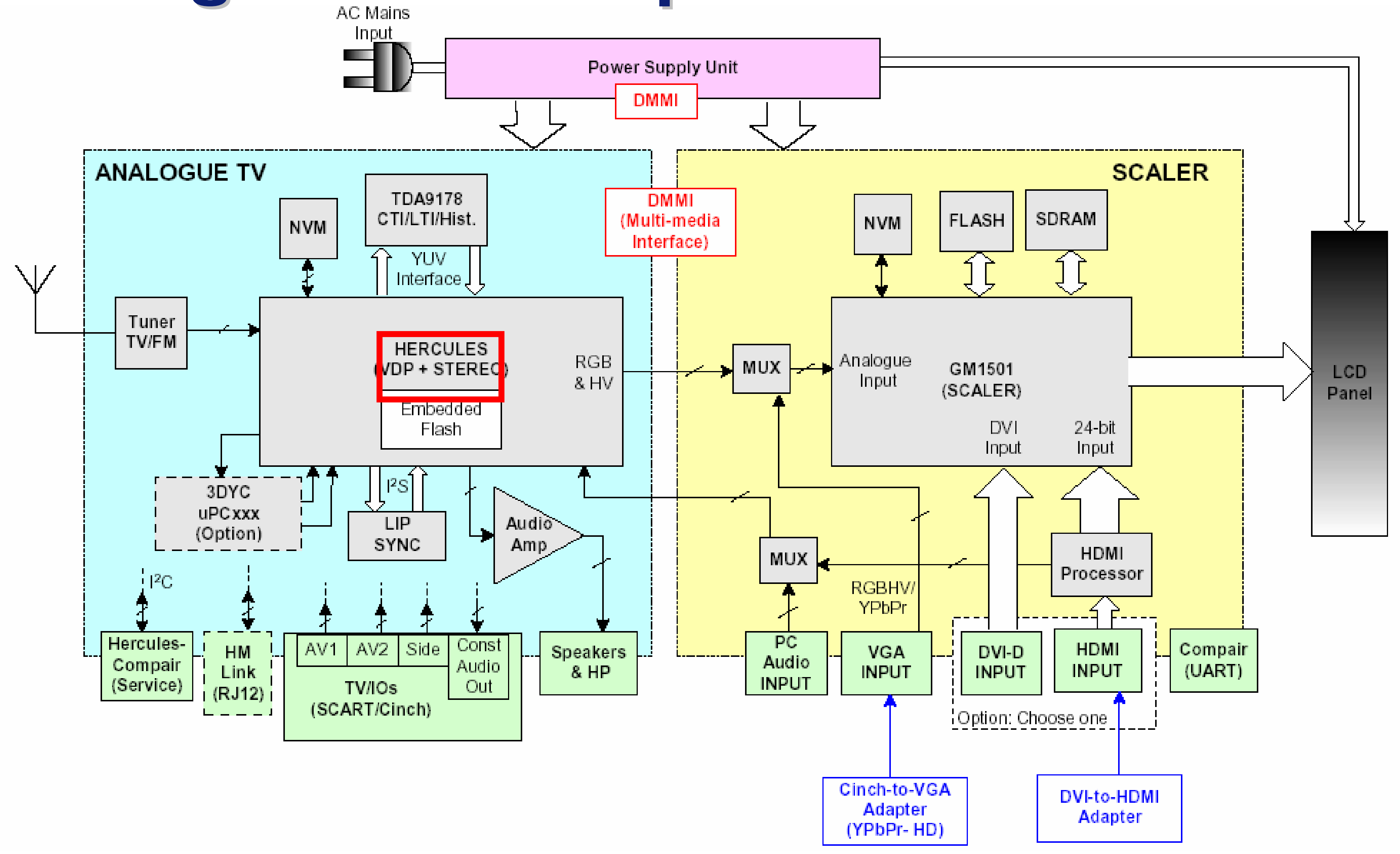


Panel de TV y Scaler

Solamente hay un panel para soportar todo el rango. La tabla muestra diferentes versiones del Hercules utilizado en diferentes regiones, debido a características y coste.

Platform Solution	Region	Analogue TV	Scaler	PCB
LC04C	Europe(/12, /58)	Hercules TDA12021H/N1B10	Gm 5221	1
	LATAM	Hercules TDA12011H/N1B50		
	AP/69	Hercules TDA12021H/N1B10		
	AP/61	Hercules TDA12011H/N1B50		
	NAFTA	Hercules TDA12001H/N1B50		

Diagrama de bloques



Conectividad de E/S

Screen Size	Region	AV1		AV2		Const. Level Out	HD/PC (Analog)	PC-Audio In	HD/PC (Digital)		PCB
		CVBS	YPbPr (1Fh)	CVBS	SVHS		VGA		HDMI	DVI	
17"	NAFTA	Mini Jack (CVBS,L,R)	3 Cinch	Mini Jack(CVBS,L,R)			15p-Dsub	Mini Jack	HDMI		1
	AP/ LATAM	Mini Jack (CVBS,L,R)	3 Cinch	Mini Jack(CVBS,L,R)			15p-Dsub	Mini Jack		DVI-D	2
	EUR	SCART		SCART		Mini Jack	15p-Dsub	Mini Jack			3
23 / 26"	NAFTA	3 Cinch	3 Cinch	Mini Jack (CVBS+L+R)	S-VHS		15p-Dsub	Mini Jack	HDMI		4
	AP/ LATAM	3 Cinch	3 Cinch	Mini Jack (CVBS+L+R)	S-VHS		15p-Dsub	Mini Jack		DVI-D	5
	EUR	SCART		SCART		Mini Jack	15p-Dsub	Mini Jack		DVI-D	6

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Curso LC04
03. Alimentación

Philips Ibérica – Electrónica de Consumo
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Cristina Senallé - Gabriel Arianes
Noviembre 2004

Descripción de la alimentación

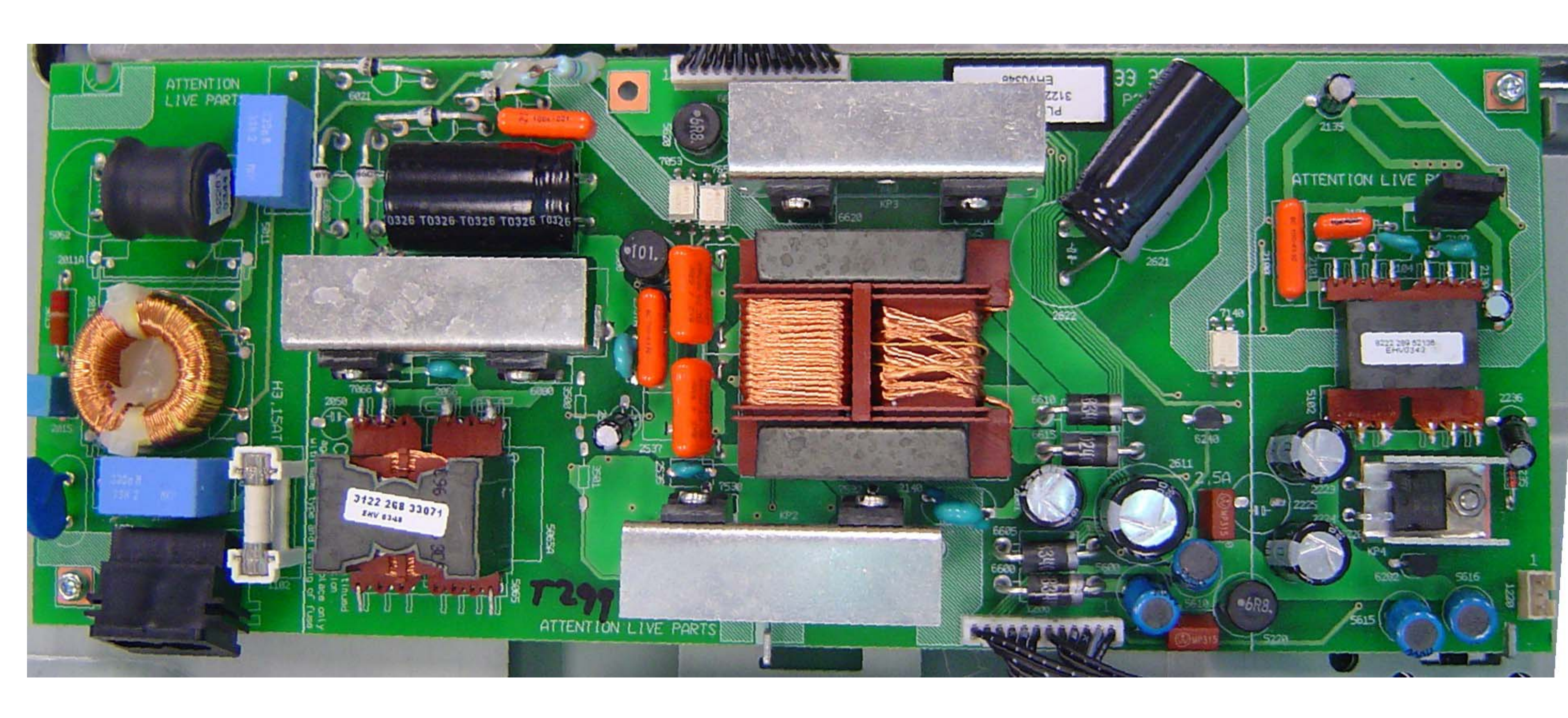
El sistema de alimentación se compone de:

- Entrada CA con fusible
- Alimentación Standby separada
- Circuito de harmónicos de red
- Rectificador de tensión de red

La alimentación proporciona las siguientes tensiones DC:

- Alimentación de audio (para los amplificadores de potencia de audio)
- Alimentación de 3V3 (para el UOCIII, el Scaler y otra circuitería digital)
- 13V sin regular, a partir de los que se generan 5V, 8V y 12V regulados
- Alimentación Bolt-on (para los módulos Bolt-on como por ejemplo, iDTV, DVD-Combi, ITV, HMR,...)

Alimentación



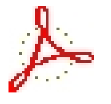
Alimentaciones del LC04 según panel

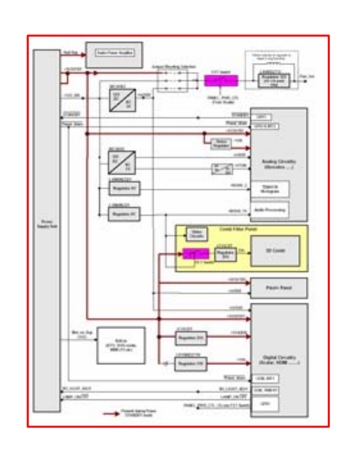
	14"	15"	17"	20"	23"	26"
Power	50W	50W	70W	70W	150W	170W
Inverter	Yes	Yes	Yes	Yes	No	No
Sound	2X3W	2X3W	2X3W	2X5W	2X5W	2X5W
L*W*H(mm)	170X105X20	170X105X20	220X75X20	220X75X20	228X100X22	260X100X26

SIZE	Type	Man	LCD Panel Typical Drive				TYPICAL LAMP CHARACTERISTICS				INVERTER(max)			DC-DC converter	Panel power supply position diversity								GPIO port			
			V	A	W	A (max)	NO.	V	mA	W	V	A	W		5955	5956	5957	5959	5960	1951	7953	2959	3425	3426	3427	3428
14	T140VN01	AUO	5	0.6	3	1.8	4	940	6					Yes		Y		Y		Y						
15	LC150X02-A5	LPL	5				4		6	20.2				Yes		Y		Y		Y						Y
17	LC171W03	LPL	12	0.18	2.16		6	670	7	28.2						Y		Y			Y	Y	Y		Y	
20	LC201V02	LPL	12	0.15	1.79		6	720	7	30.2						Y		Y			Y	Y			Y	Y
20	T201VN01	AUO	5	1.5	7.5		12	760	5		12	4.5	55	Yes		Y		Y		Y			Y		Y	Y
23	LC230W01	LPL	12	0.28	2.76		12				24	3.2	77			Y	Y						Y	Y		
23	QD23WL01	QDI	12	0.35		0.55	12	1000	5	60	24					Y	Y							Y		

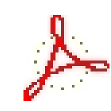
Arquitectura de la alimentación

Arquitectura





Estados



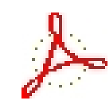




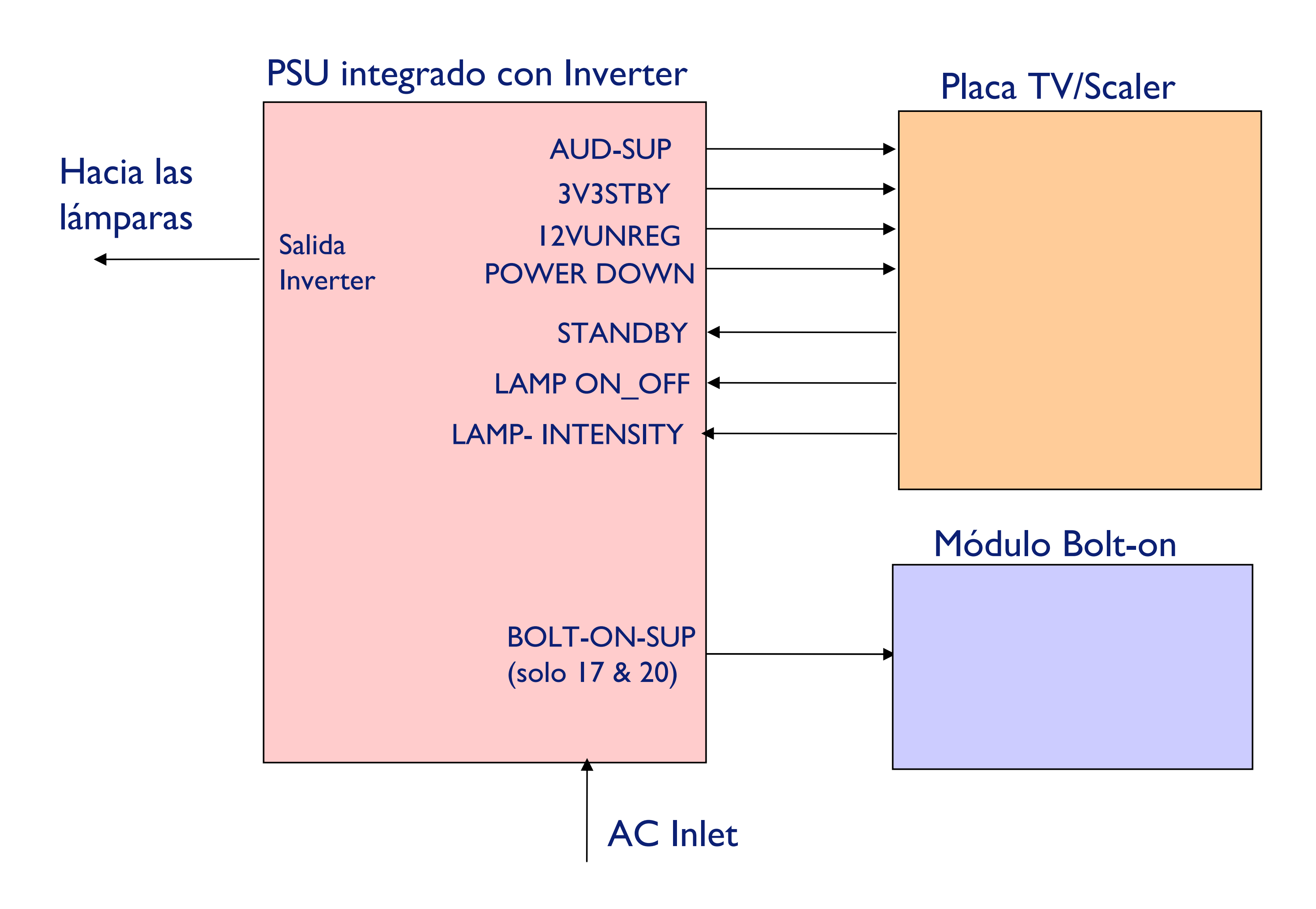
Sistema de reset

Delay=50ms
Delay=50ms
VTH=2.7V
3.3V
RESET
NE56610-27
10ms
POWER
DOWN
1.8V
RESET
HERC-
INTERNAL
10ms
POWER
DOWN
START UP
POWER INTERRUPTION
SHUT DOWN

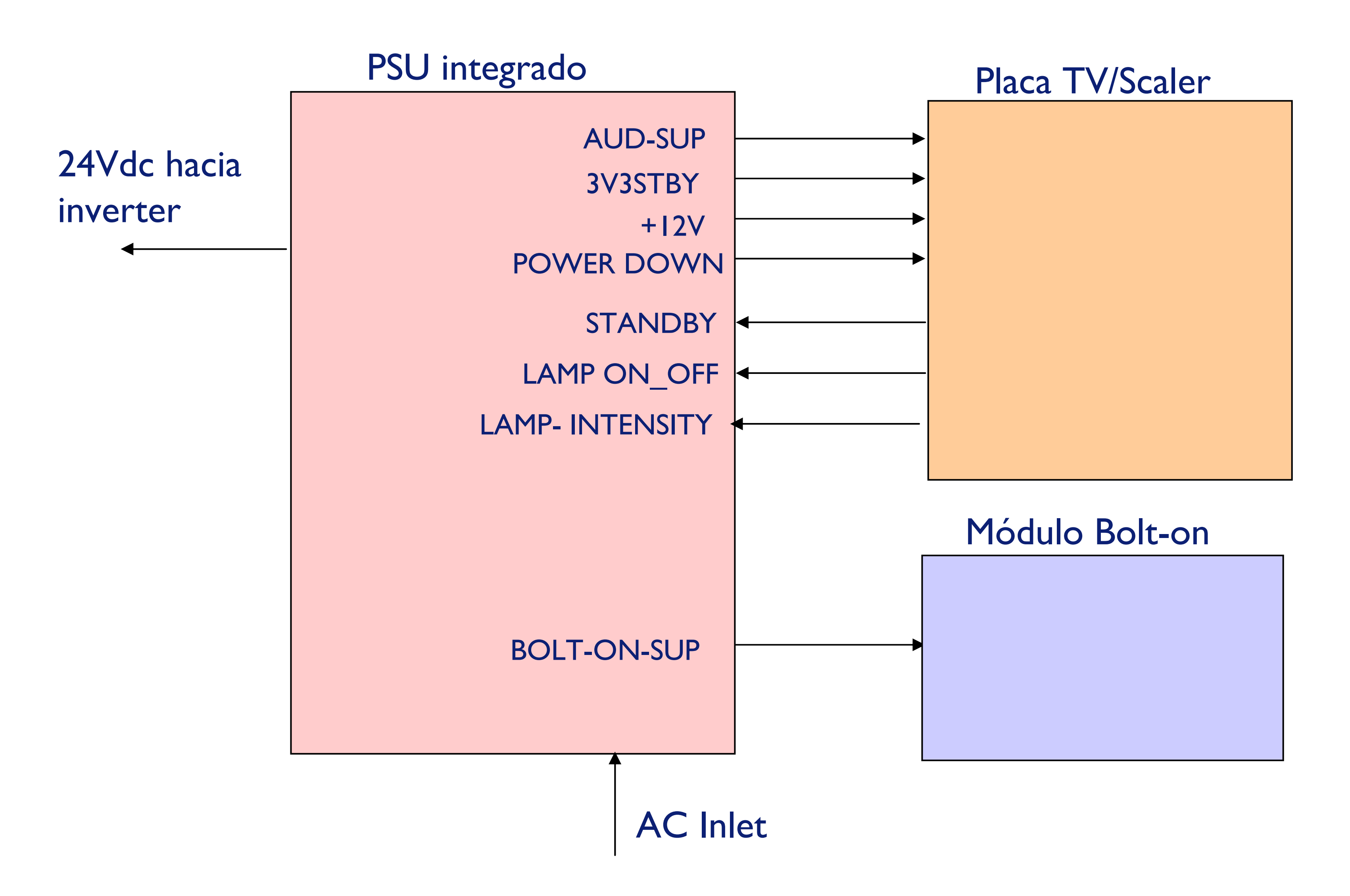
Sistema de reset



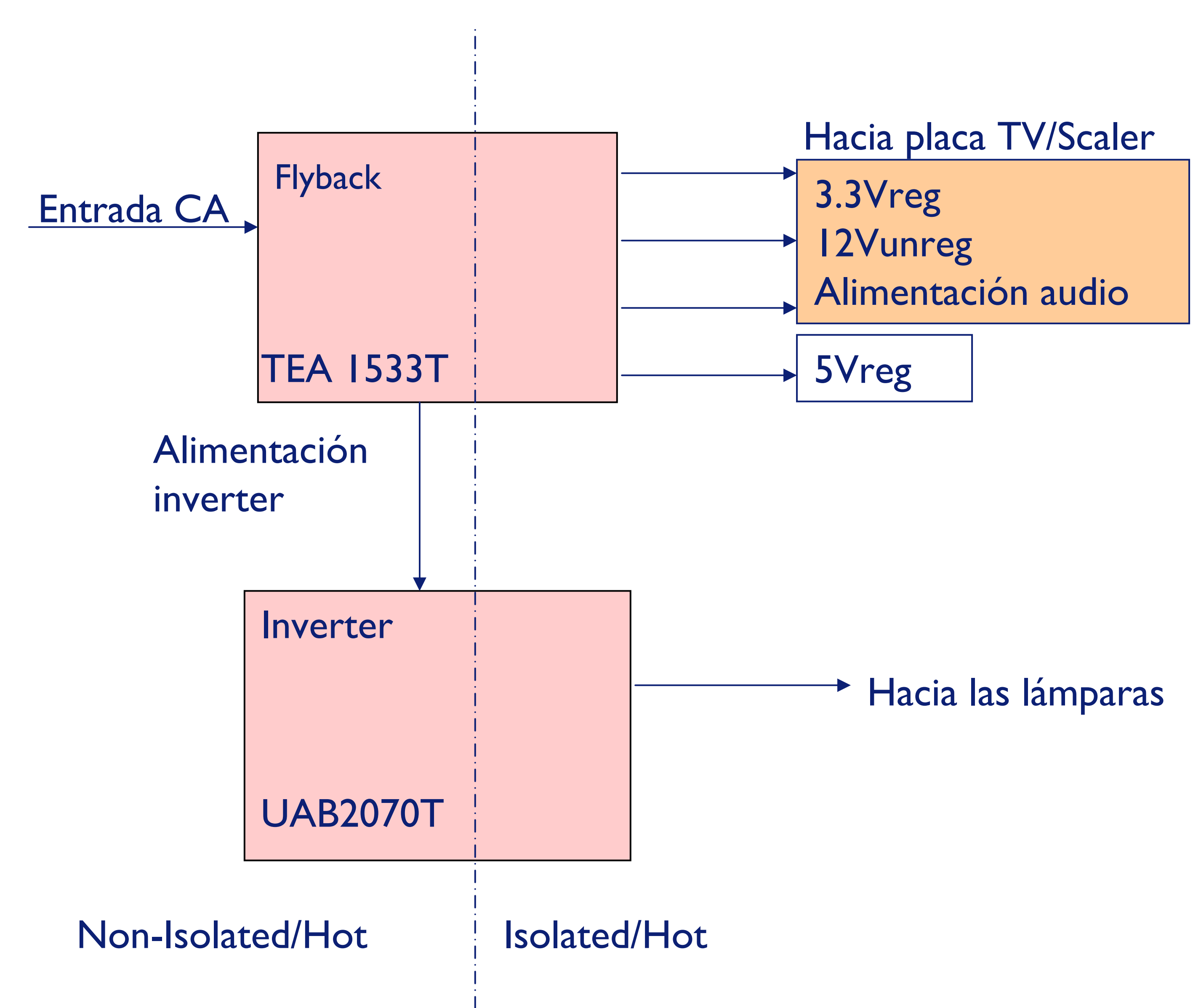
De 14” a 20”


PSU integrado con Inverter
Placa TV/Scaler
Hacia las lámparas
Salida Inverter
AUD-SUP
3V3STBY
12VUNREG
POWER DOWN
STANDBY
LAMP ON_OFF
LAMP- INTENSITY
Módulo Bolt-on
BOLT-ON-SUP (solo 17 & 20)
AC Inlet

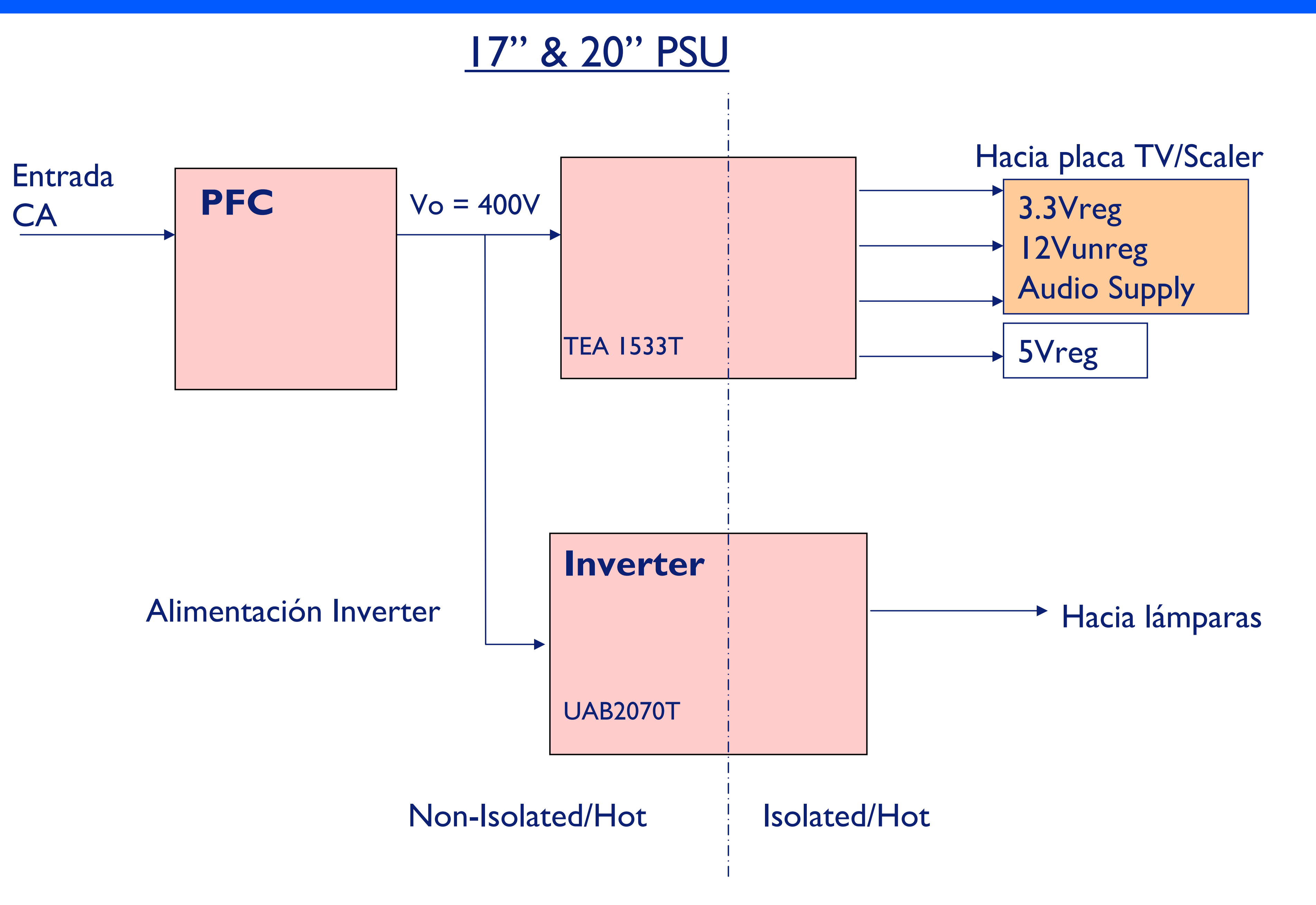
23" y 26"


PSU integrado
Placa TV/Scaler
24Vdc hacia inverter
AUD-SUP
3V3STBY
+12V
POWER DOWN
STANDBY
LAMP ON_OFF
LAMP- INTENSITY
Módulo Bolt-on
BOLT-ON-SUP
AC Inlet

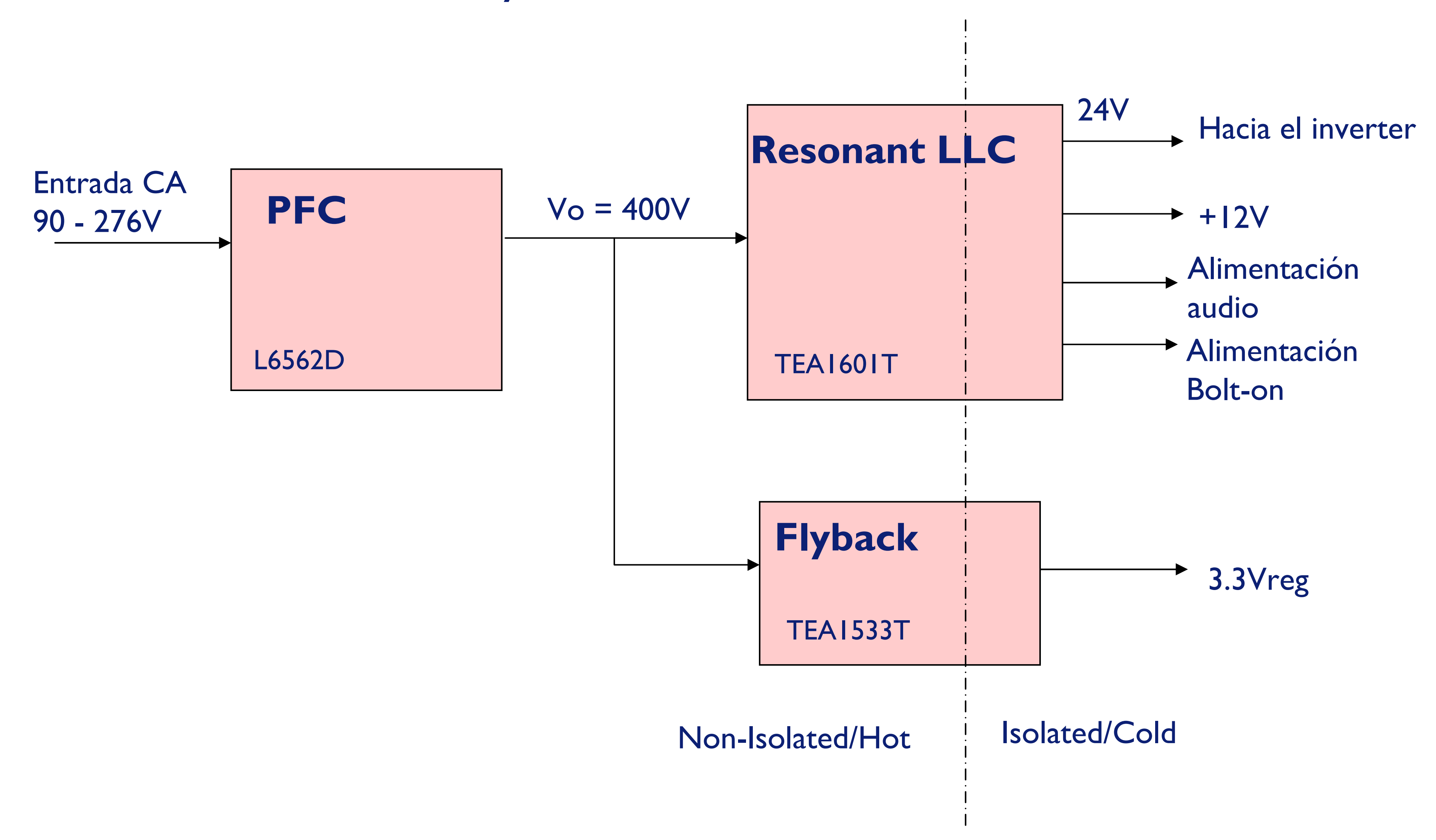
14" y 15" PSU


Entrada CA
Flyback
TEA 1533T
Hacia placa TV/Scaler
3.3Vreg
12Vunreg
Alimentación audio
5Vreg
Alimentación
inverter
Inverter
UAB2070T
Hacia las lámparas
Non-Isolated/Hot
Isolated/Hot

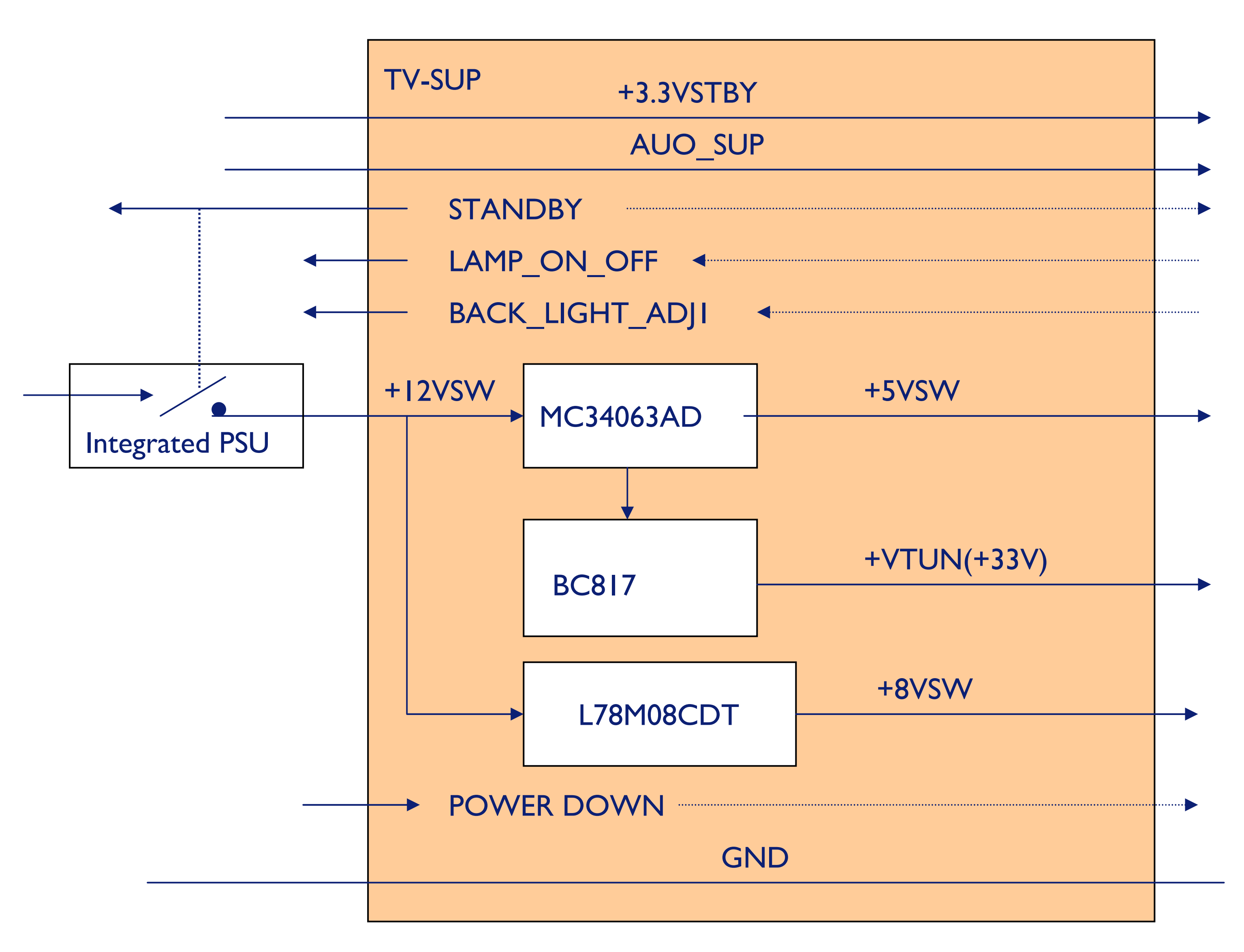
17" & 20" PSU


Entrada
CA
PFC
Vo = 400V
TEA 1533T
Hacia placa TV/Scaler
3.3Vreg
12Vunreg
Audio Supply
5Vreg
Alimentación Inverter
Inverter
UAB2070T
Hacia lámparas
Non-Isolated/Hot
Isolated/Hot

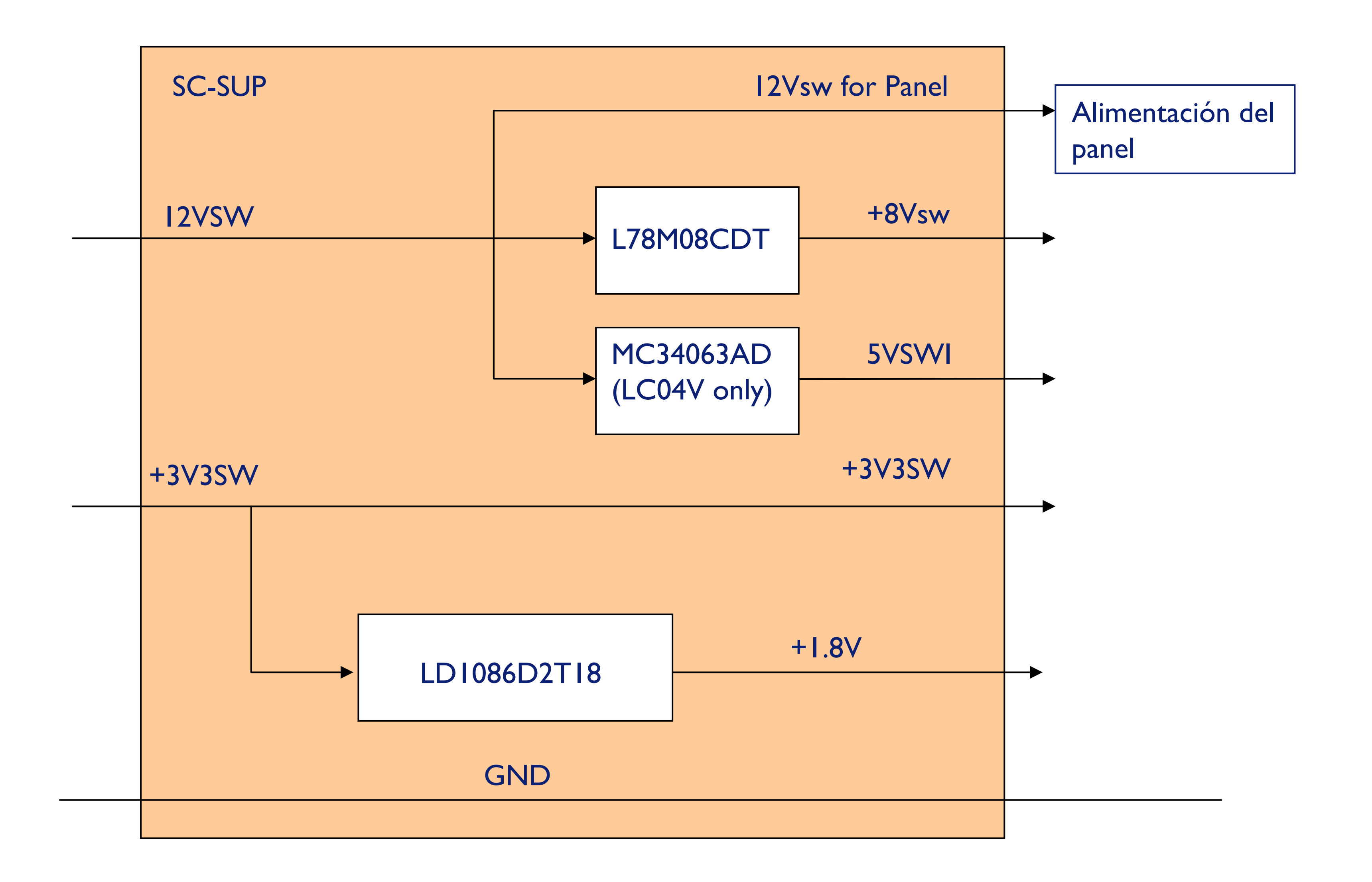
23" y 26" PSU interno



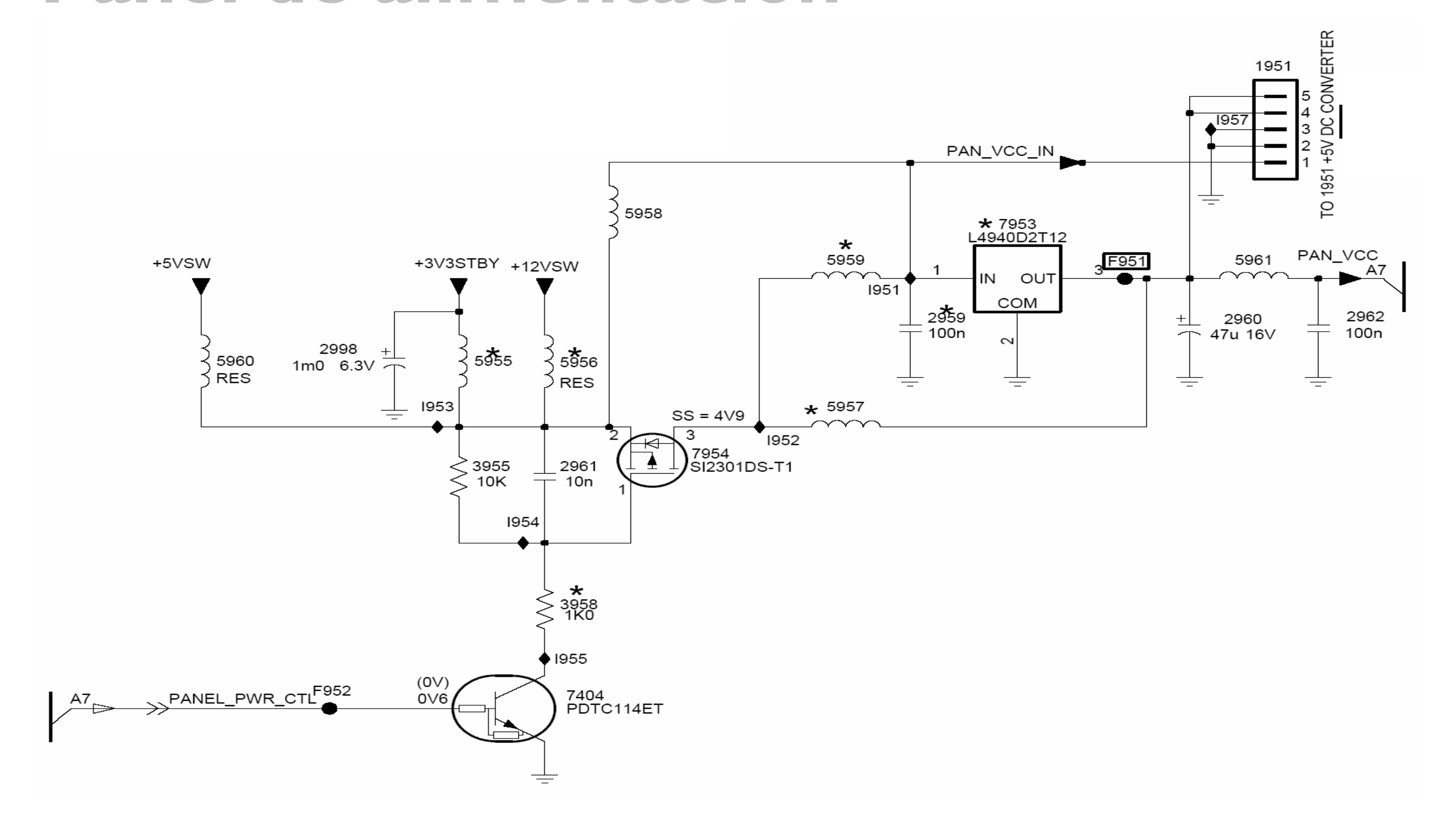
Alimentación TV



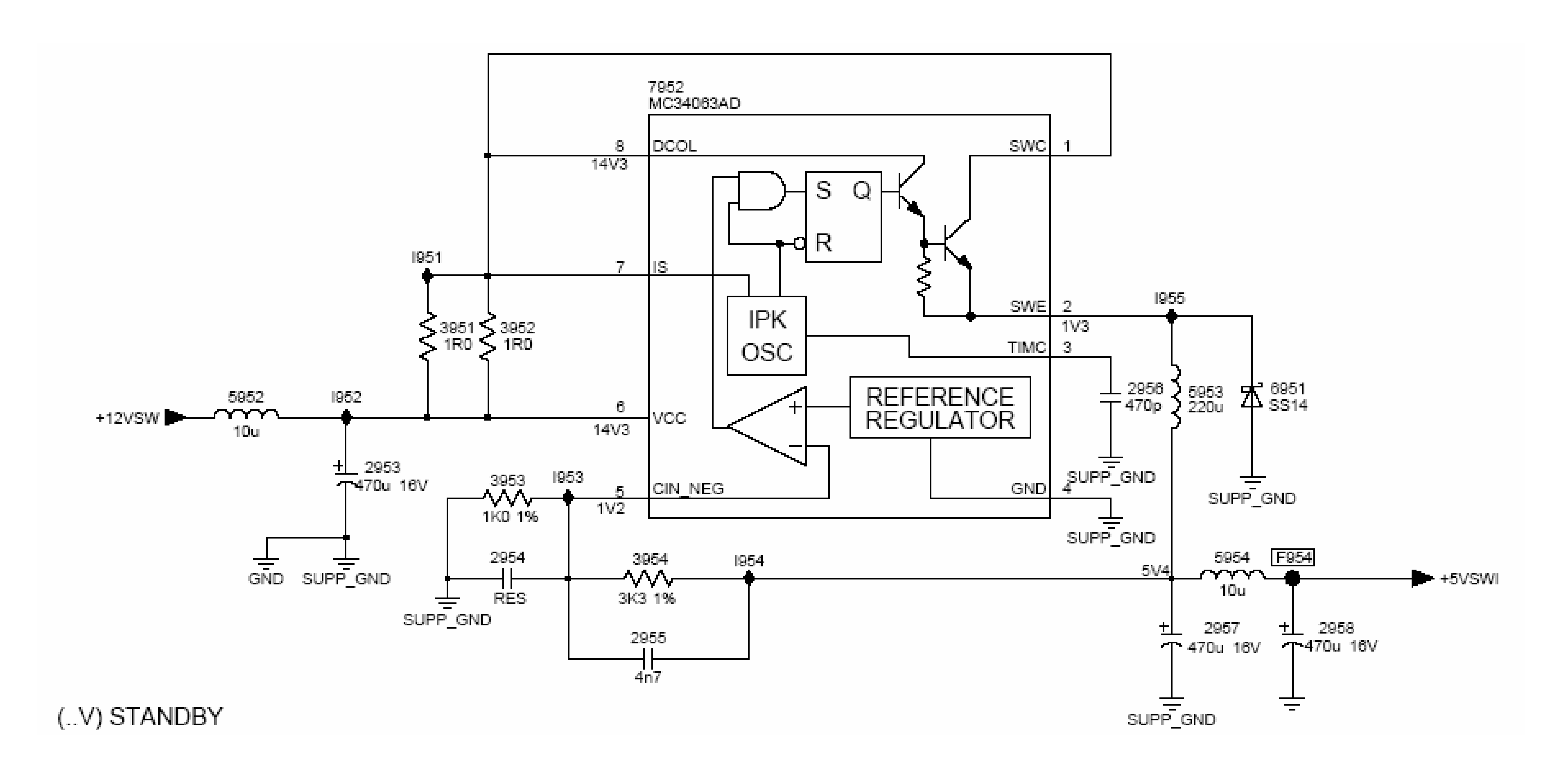
Alimentación del Scaler



Panel de alimentación



MC34063AD

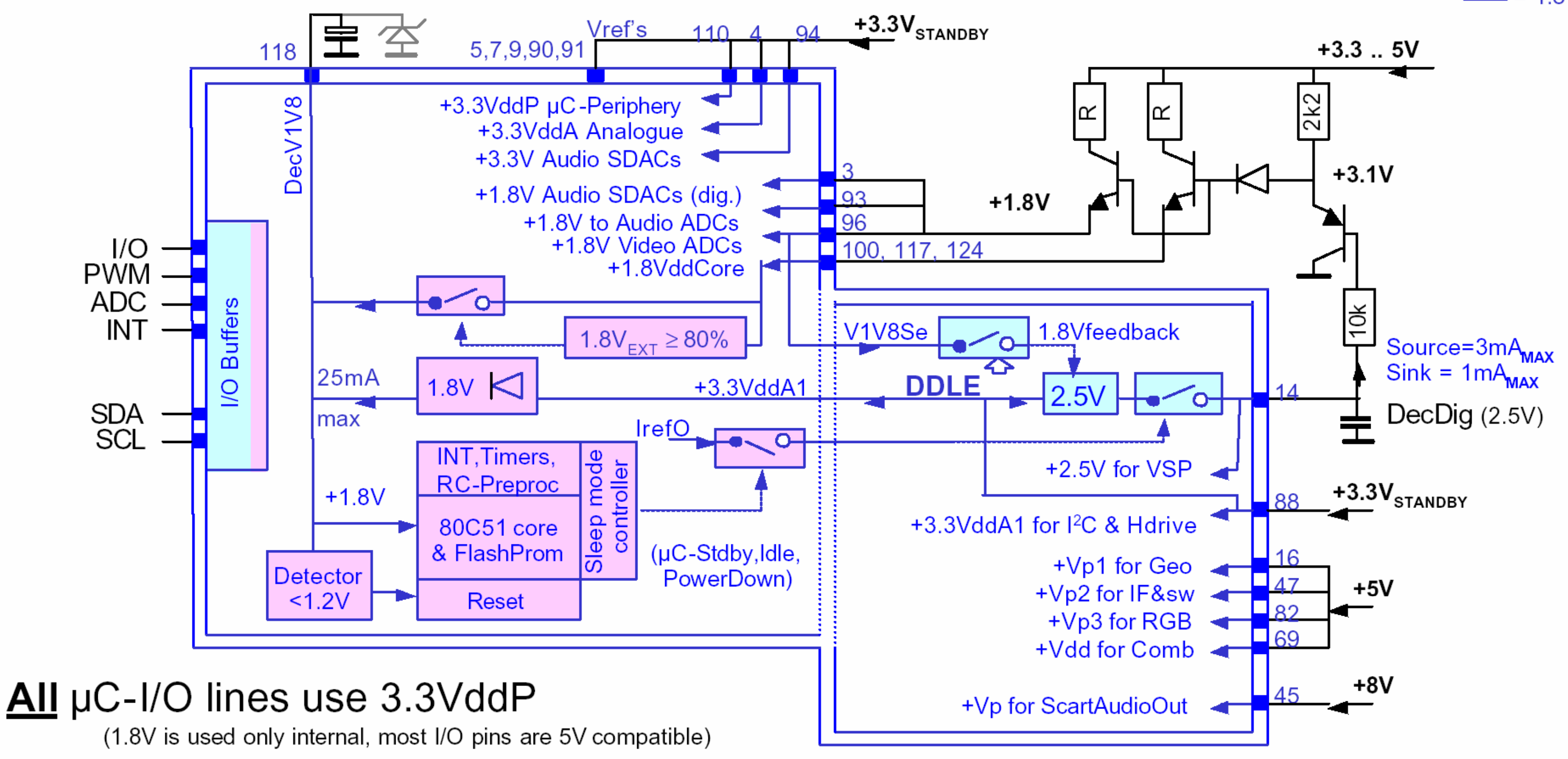

7952
MC34063AD
8
DCOL
14V3
SWC
1
S
Q
R
I951
7
IS
IPK
OSC
SWE
2
1V3
I955
TIMC
3
3951
1R0
3952
1R0
REFERENCE
REGULATOR
2956
470p
5953
220u
6951
SS14
+12VSW
5952
10u
I952
6
VCC
14V3
2953
470u 16V
3953
1K0 1%
I953
5
1V2
CIN_NEG
GND
4
SUPP_GND
GND
2954
RES
3954
3K3 1%
I954
5V4
5954
10u
F954
+5VSWI
2955
4n7
2957
470u 16V
2958
470u 16V
(..V) STANDBY

Paneles LCD & PSU

	Resolution	14"	15"	17"	20"	23"	26"
	Resolution	**VGA**	**XGA**	**XGA**	**VGA**	**XGA**	**XGA**
PSU		BL4L50P2	BL4L50P3	BL6L70P1	BL6L70P3	PLCD150P1	PLCD170P1
		3341 101 20011	3341 101 20021	3122 1137 23041	3122 137 23101	3122 137 23071	3122 137 23081
LPL Panel			LC150X02-A5	LC171W03-A4	LC201V02-A3	LC230W01	LC260W01
			9322 207 48682	9322 196 32682	9322 197 44682	9322 194 30682	9322 205 71682
AUO Panel		T140VN01					
		9322 207 49682					
QDI Panel						QD23WL01	
						9322 207 27682	

	Panel		PSU		Audio		DC/DC Converter
	First Source	Second Source					
14PF6826	T140VN01	9322 207 49682	BL4L50P2	3341 101 20011	2X2W	4 ohm	Yes
14PF7846	T140VN01	9322 207 49682	BL4L50P2	3341 101 20011	2X2W		Yes
15PF7946	LC150X02-A5	9322 207 48682	BL4L50P3	3341 101 20021	2X2W		Yes
15PF8946	LC150X02-A5	9322 207 48682	BL4L50P3	3341 101 20021	2X2W		Yes
15HF8946	LC150X02-A5	9322 207 48682	BL4L50P3	3341 101 20021	2X2W		Yes
15FT3011	LC150X02-A5	9322 207 48682	BL4L50P3	3341 101 20021	2X2W		Yes
17PF8946	LC171W03-A4	9322 196 32682	BL6L70P1	3122 1137 23041	2X2W		
20 PF7846	LC201V02-A3	9322 197 44682	BL6L70P3	3122 137 23101	2X5W	8 ohm	
20PF8846	LC201V02-A3	9322 197 44682	BL6L70P3	3122 137 23101	2X5W		
20HF7846	LC201V02-A3	9322 197 44682	BL6L70P3	3122 137 23101	2X5W		
23PF8946	QD23WL01	9322 207 27682	PLCD150P1	3122 137 23071	2X5W		

Which Vdd goes where:



- **All** µC-I/O lines use 3.3VddP
  (1.8V is used only internal, most I/O pins are 5V compatible)
- **ALL** 3.3V supply inputs **must** be connected to the **same** net (all 5V inputs also to one net)
- Self-controlled 1.8V loop, **no** external stabilisers needed

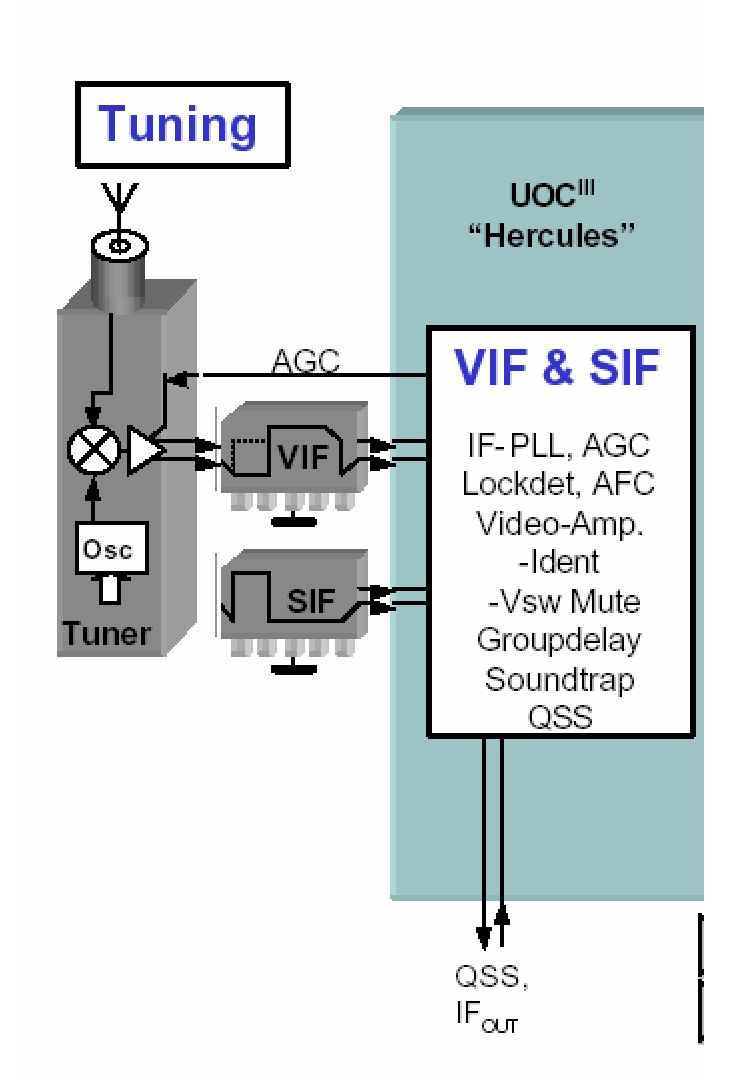
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Curso LC04
04. Sintonizador

Philips Ibérica – Electrónica de Consumo
Departamento Técnico
Cristina Senallé - Gabriel Arianes
Noviembre 2004

Contenido

1. Diversidad de sintonizadores
2. Asignación de pines en el sintonizador
3. Diversidad de filtros SAW
4. Asignación de pines en los filtros SAW
5. Diagrama de bloques Tuner/IF
6. Tabla de opciones
7. Ajustes AGC



Diversidad de sintonizadores

Sintonizador	Sistema	Conector
UR1316 MK3	**PAL/SECAM** **10.7MHz FM IF**	**IEC plug**
UR1336 MK3	NTSC/LATAM 10.7MHz FM IF	F plug

Asignación de pines del sintonizador

Número de pin	Descripción	Tensión DC
1	Tensión AGC	4.0-5.0VDC señal débil o sin señal <4.0V para señal fuerte
2	Sin conectar	-
3	Selección de bus de dirección I2C	1.0V
4	SCL	0 a 3.3V
5	SDA	0 a 3.3V
6, 7	Tensión de alimentación	5VDC +/- 0.25V
8	Sin conectar	-
9	Tensión de sintonía	33VDC +/- 2V
10	Salida radio FM IF	-
11	Salida IF TV	-

Diversidad de filtros SAW

País	#1328 (Video)	#1329 (Video2)	#1330 (Audio)
EUROPE	OFWK3953L	-	OFWK9656L
AP	OFWK7265L	-	OFWK9361L
CHINA	OFWK3956L	OFWK3955L	OFWK9352L
NAFTA	OFWM1967L	-	-

Diversidad de filtros SAW

La conmutación de los filtros SAW se realiza a través de la línea SEL_IF

Región	SEL_IF	Sistema
Europa	1	L'
	0	Otros
AP	1	M/N
	0	B/G, D/K, I
CHINA	1	B/G, D/K
	0	M/N
NAFTA	Sin uso	NTSC

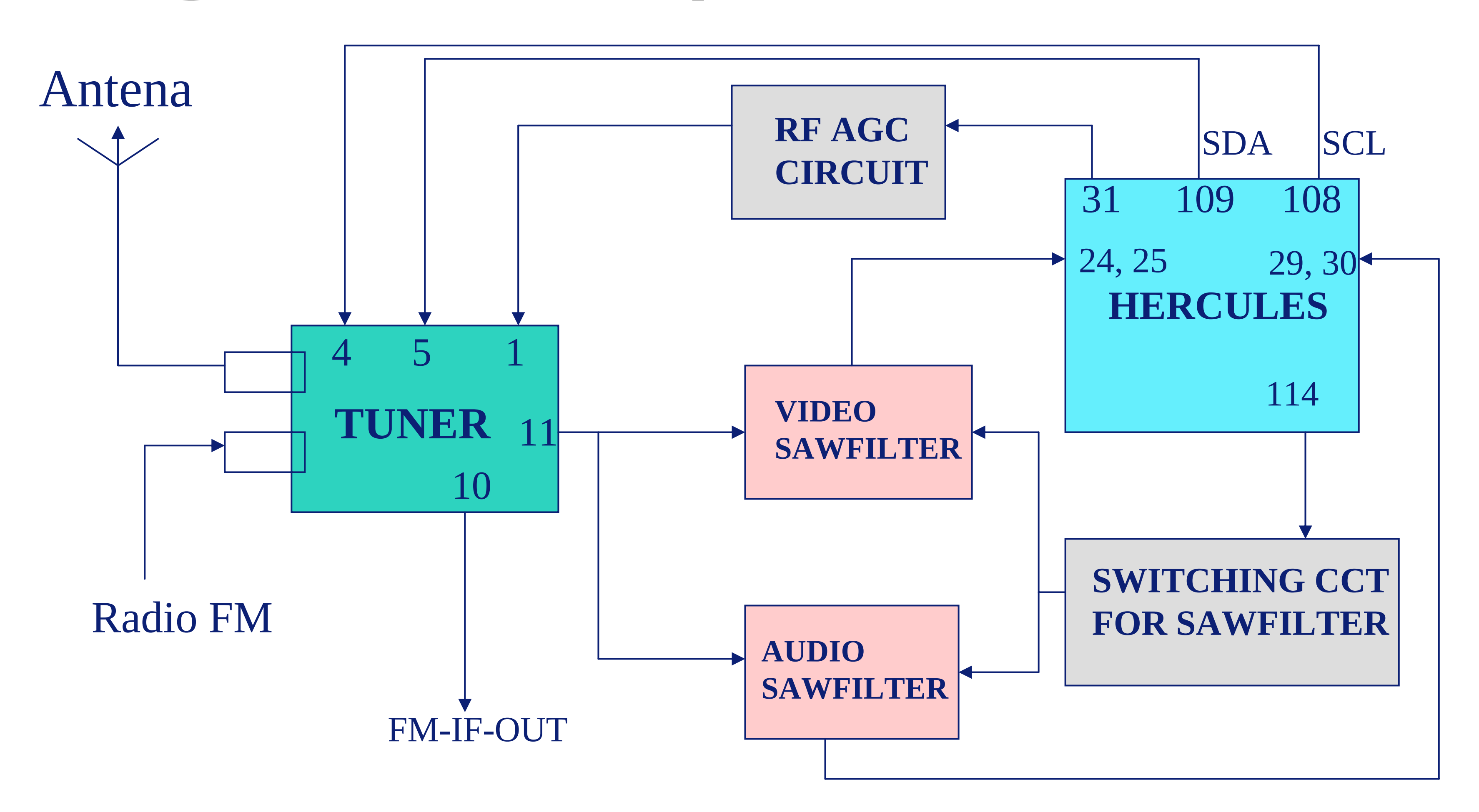
Asignación de pines de los filtros SAW de video

Número de pin	K3953L	K7265L	K3956L	K1967L	K3955L
2	Entrada	Entrada	Entrada	Entrada	Entrada
3	Entrada - Masa	Entrada conmutable (B/G, D/K, I: a masa M/N: a Pin 2)	Entrada - Masa	Entrada - Masa	Entrada - Masa
7	Salida	Salida	Salida	Salida	Salida
8	Salida	Salida	Salida	Salida	Salida

Asignación de pines de los filtros SAW de audio

Número de pin	K9656L	K9361L	K9352L
2	Entrada	Entrada	Entrada
3	Entrada conmutable (B/G, D/K, I: a masa M/N: a pin 2)	Entrada - Masa	Entrada - Masa
7	Salida	Salida	Salida
8	Salida	Salida	Salida

Diagrama de bloques



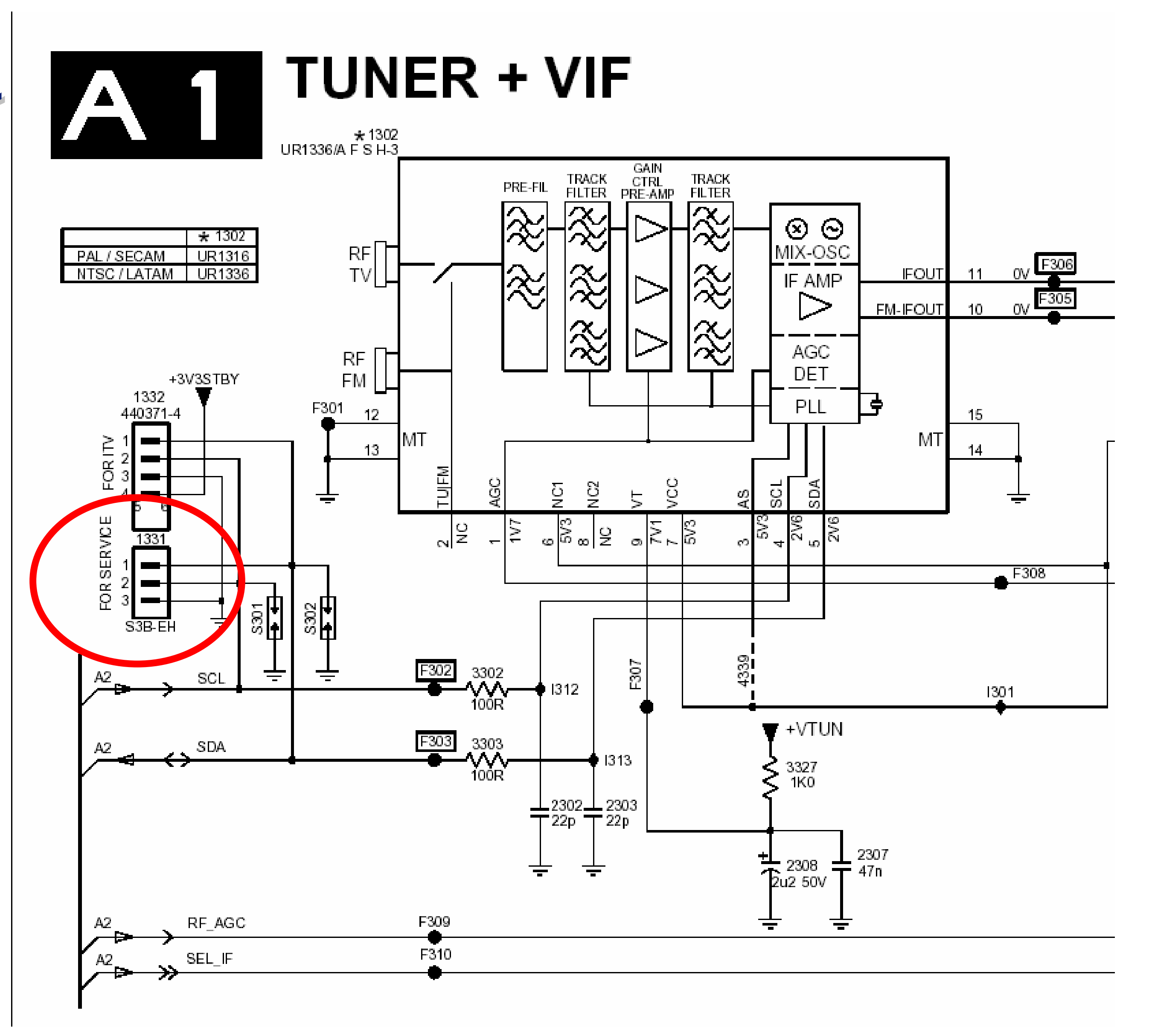
Ajuste AGC

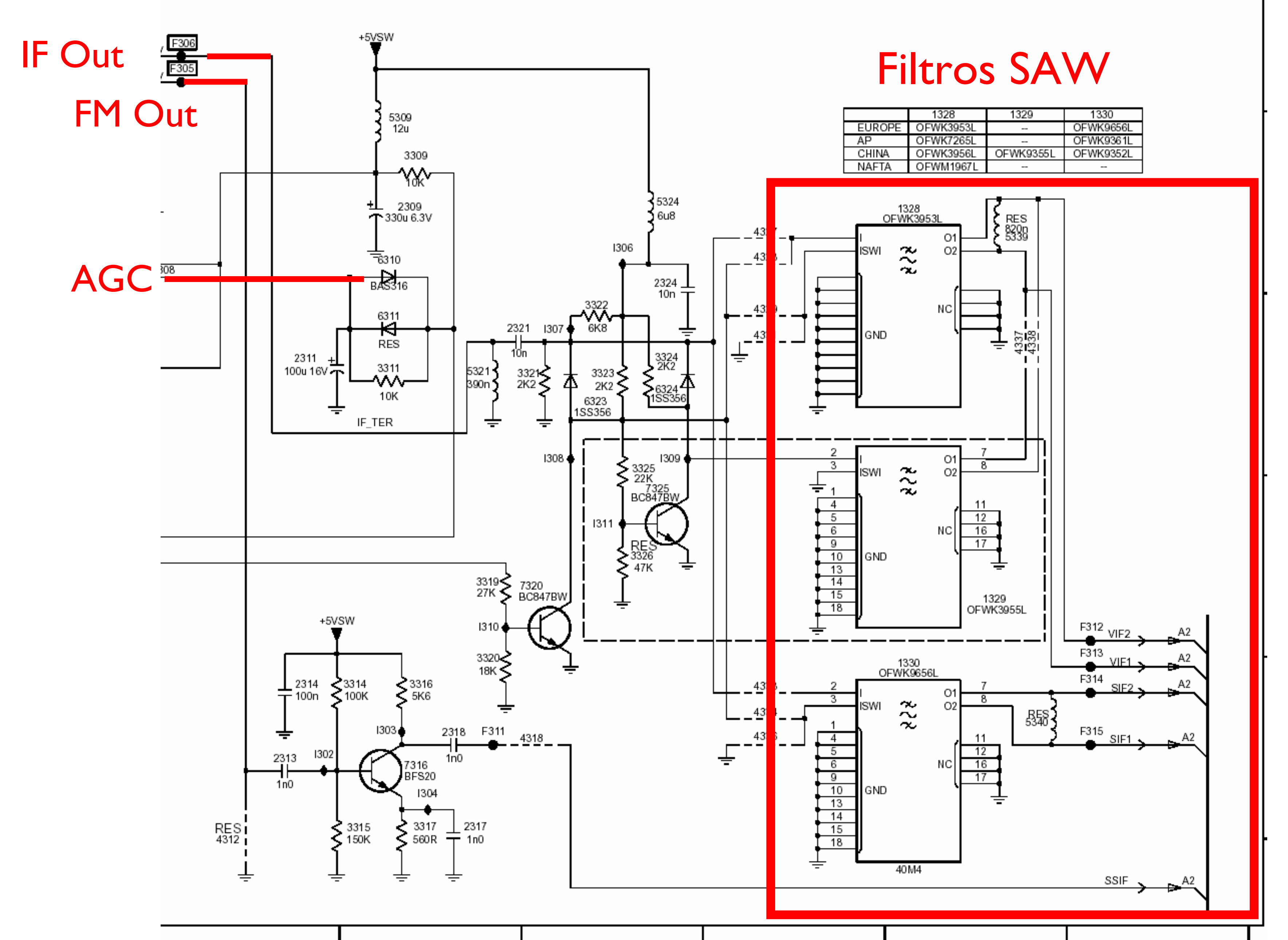
Dos ajustes:

- Para L'
- Para el resto de sistemas
  - Activar el menú SAM
  - En el submenú AFC Window del menú Tuner ajustar el valor a 100 KHz
  - Seleccionar el submenú AGC
  - Conectar el multímetro al punto de test F306 (pin 1 del sintonizador)
  - Ajustar el AGC hasta que la tensión sea 3.3VDC +0.5/ -1.0
  - Para almacenar el dato pasar el aparato a Standby

Diagrama

Conector ComPair





	1328	1329	1330
EUROPE	OFWK3953L	--	OFWK9656L
AP	OFWK7265L	--	OFWK9361L
CHINA	OFWK3956L	OFWK9355L	OFWK9352L
NAFTA	OFWM1967L	--	--

PHILIPS

Curso LC04
05. Video - Hércules

Philips Ibérica – Electrónica de Consumo
Departamento Técnico
Cristina Senallé - Gabriel Arianes
Noviembre 2004



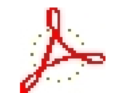
Fuentes de video

Señales analógicas de video 1Fh

Provienen directamente del sintonizador, los euroconectores o los conectores laterales y son directamente procesadas por el **Hércules**.

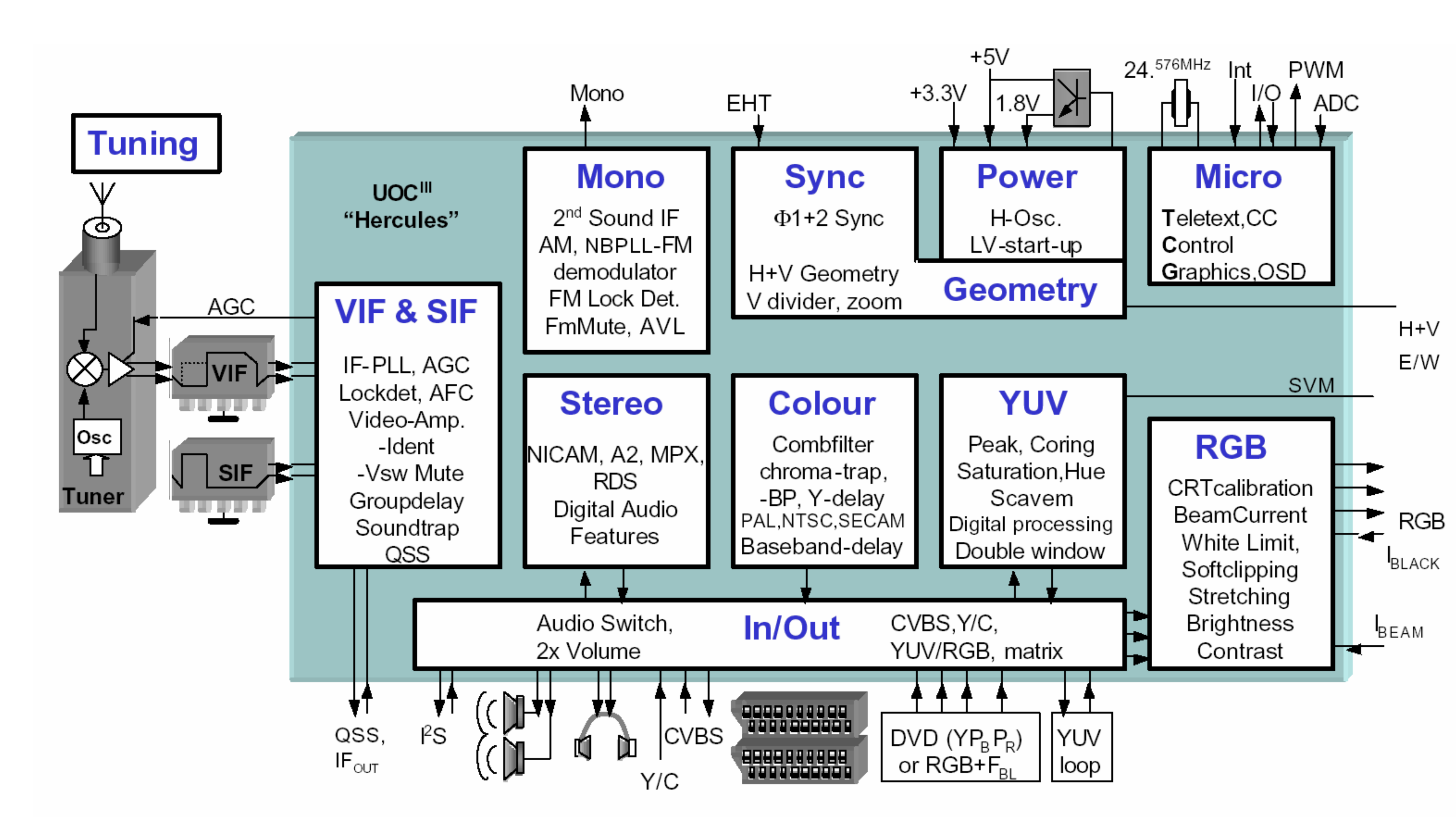
Señales analógicas de video 2Fh o HD

Provienen directamente del conector DMMI o del conector VGA y son directamente procesadas por el **Scaler**. Actualmente, sólo los módulos ATSC a través de DMMI son identificados con una señal de video 2fh.

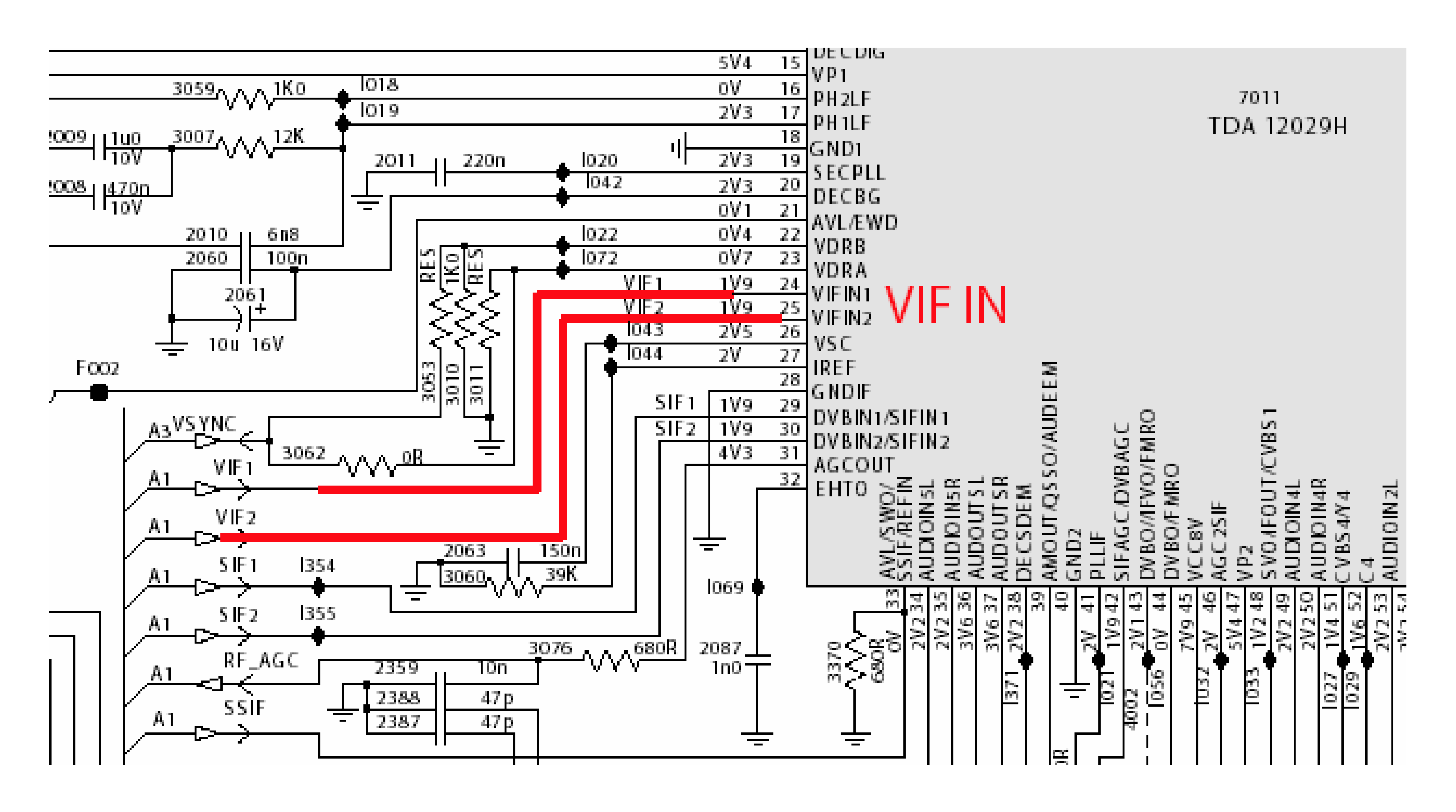


Selección de la fuente de video

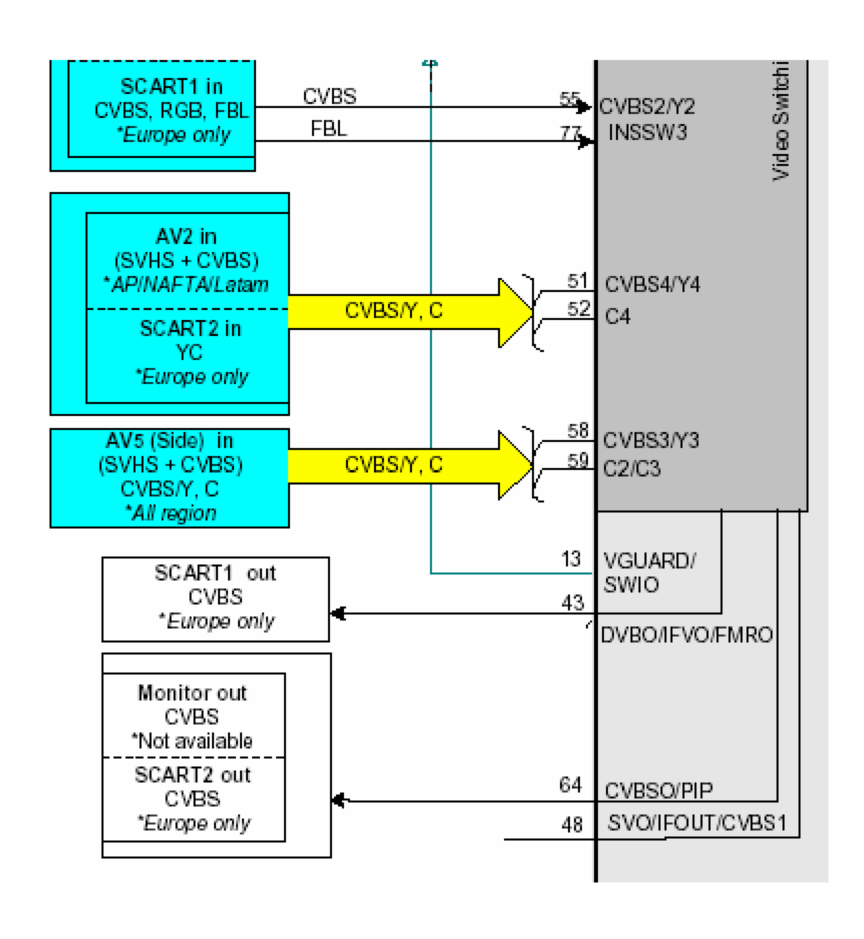
Hercules


Tuning
Tuner
Osc
AGC
VIF
SIF
UOC III
"Hercules"
VIF & SIF
IF-PLL, AGC
Lockdet, AFC
Video-Amp.
-Ident
-Vsw Mute
Groupdelay
Soundtrap
QSS
Mono
2nd Sound IF
AM, NBPLL-FM
demodulator
FM Lock Det.
FmMute, AVL
Sync
Φ1+2 Sync
H+V Geometry
V divider, zoom
Power
H-Osc.
LV-start-up
Geometry
Micro
Teletext,CC
Control
Graphics,OSD
Stereo
NICAM, A2, MPX,
RDS
Digital Audio
Features
Colour
Combfilter
chroma-trap,
-BP, Y-delay
PAL,NTSC,SECAM
Baseband-delay
YUV
Peak, Coring
Saturation,Hue
Scavem
Digital processing
Double window
RGB
CRTcalibration
BeamCurrent
White Limit,
Softclipping
Stretching
Brightness
Contrast
Audio Switch,
2x Volume
In/Out
CVBS,Y/C,
YUV/RGB, matrix
Mono
EHT
+3.3V
+5V
1.8V
24.576MHz
Int
I/O
PWM
ADC
H+V
E/W
SVM
RGB
I BLACK
I BEAM
QSS,
IF OUT
I2S
CVBS
Y/C
DVD (YPB PR)
or RGB+FBL
YUV
loop

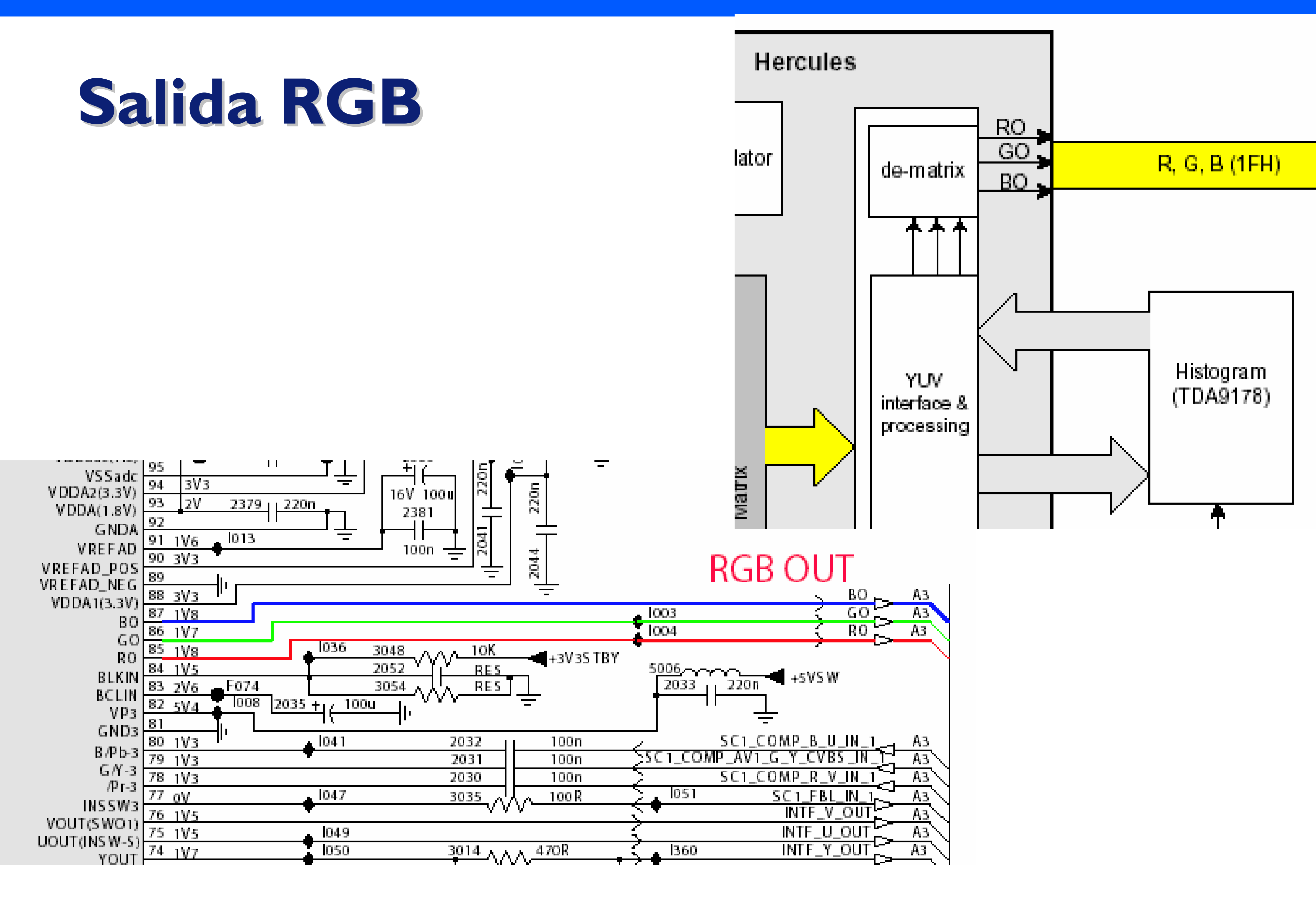
Entrada de Frecuencia Intermedia



Selección de fuente

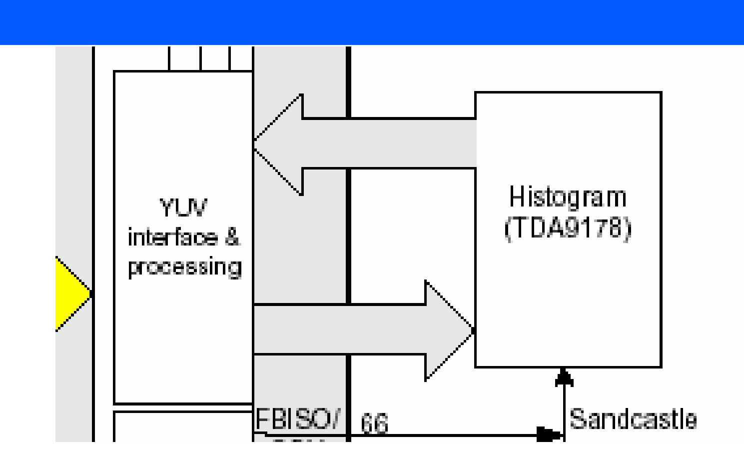


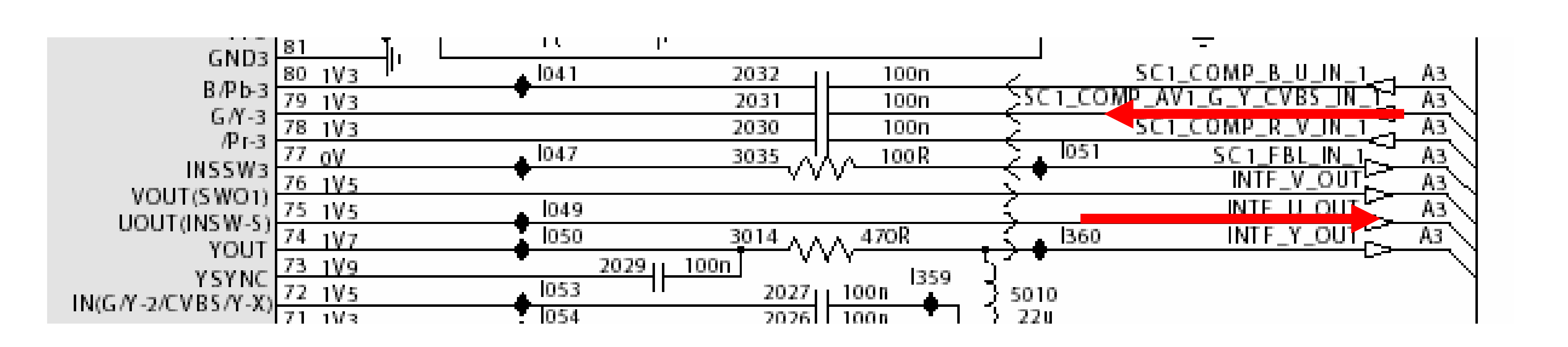
Salida RGB


Hercules
lator
de-matrix
RO
GO
BO
R, G, B (1FH)
YUV interface & processing
Histogram (TDA9178)
Matrix
RGB OUT

Histograma

(Sólo en el chasis LC4.2)





Solución de problemas

Caso 1: Sin alimentación

Comprobar +12V y 3V3 en la posición **1910**. Si no hay alimentación, comprobar el conector 1910. Si está OK, comprobar la placa de alimentación .

Caso 2: Hay alimentación pero no hay luz verde

Comprobar si los conectores **1005** y **1601** están bien conectados. En caso afirmativo, comprobar si los 3V3 están presentes.

Caso 3: No hay imagen

Comprobar la señal RGB. Si está presente, comprobar el pin 3 del integrado **7016** (NE555).

- Hay salida: el problema está en la parte del Scaler.

- No hay salida: comprobar el pin 2 del integrado (señal H-out). Si hay señal pero no hay salida, el integrado falla.

Solución de problemas

Caso 4: No hay imagen de TV pero sí de PC

Comprobar HSYNC y VSYNC en el PIN3 de **7017** y **7015**. Si están presente comprobar la salida RGB. Si no hay salida RGB puede que el integrado TDA120xx (Hércules) falle.

Caso 5: El Comb Filter no funciona

• Comprobar el bit de opciones 5 en el menú SAM

- 17PF9946/12, 23PF9946/12 y 26PF9946/12: 252
- 30PF9946/12: 224

• Comprobar los ajustes de la memoria NVM

- Valor de la dirección1229: 0000 (para aparatos de Europa)

PHILIPS

Curso LC04
06. Audio

Philips Ibérica – Electrónica de Consumo
Departamento Técnico
Cristina Senallé - Gabriel Arianes
Noviembre 2004

Diferencias en los circuitos de audio entre LC04V y LC04C

- LC4.2 proporciona más características de audio que LC4.1.
- LC4.2 EU tiene dos Scarts, LC4.1 tiene solo uno.
- Amplificador de auriculares para LC4.2 pero no para LC4.1.

Camino de la señal de Audio

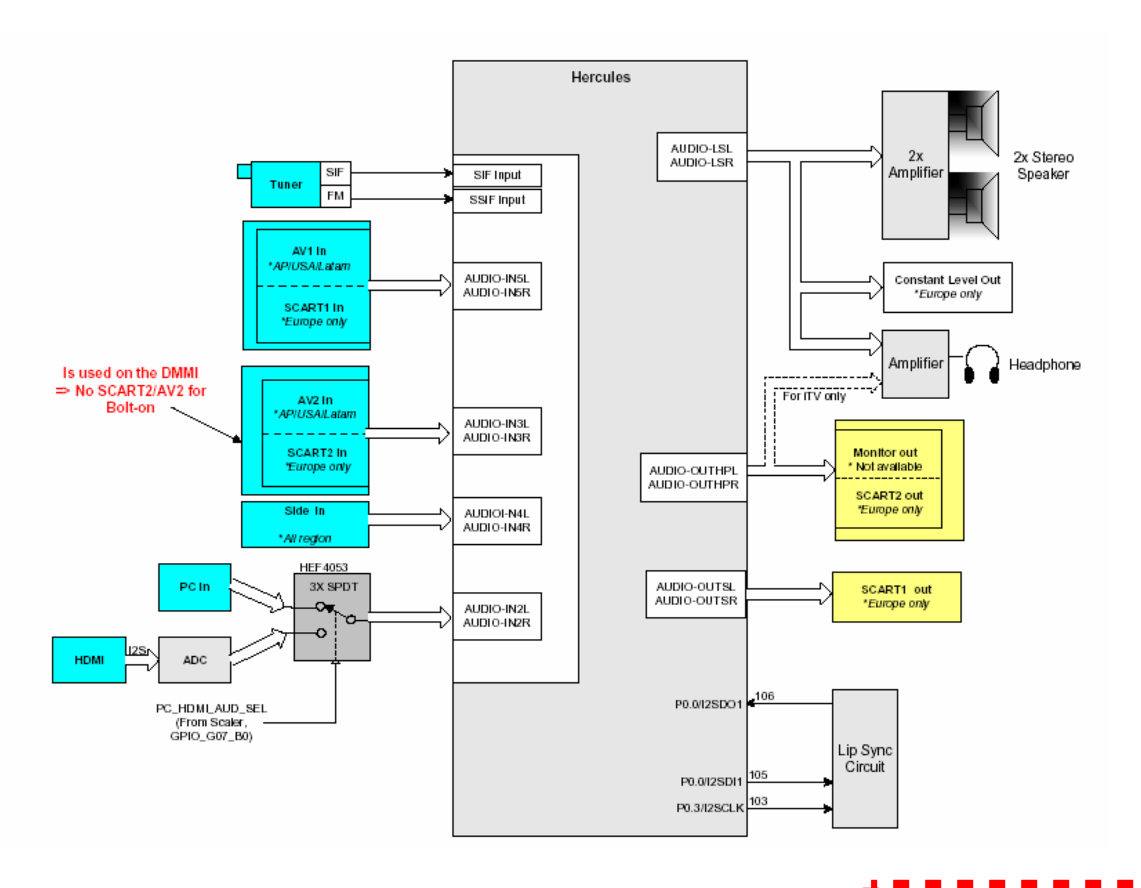
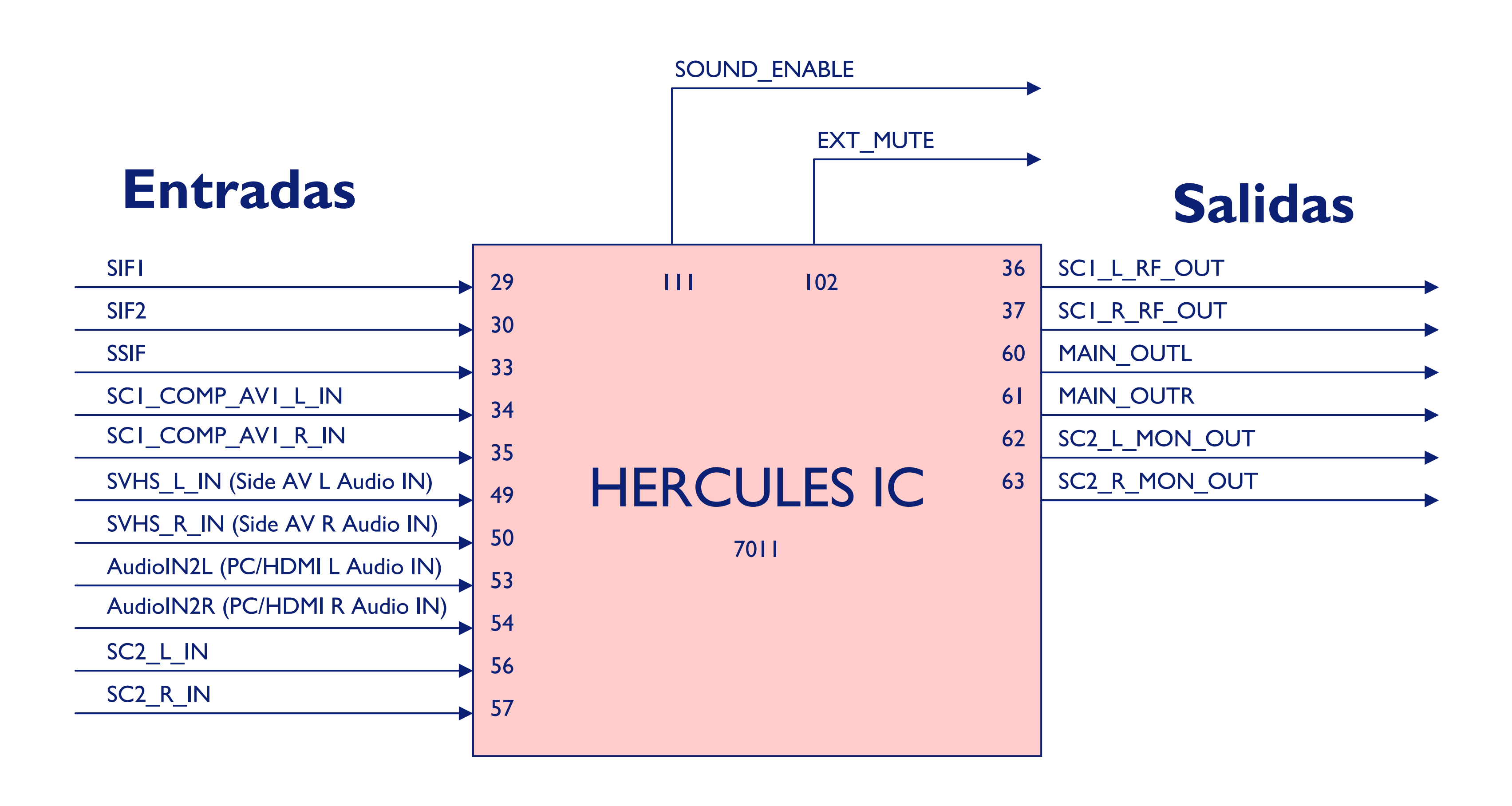
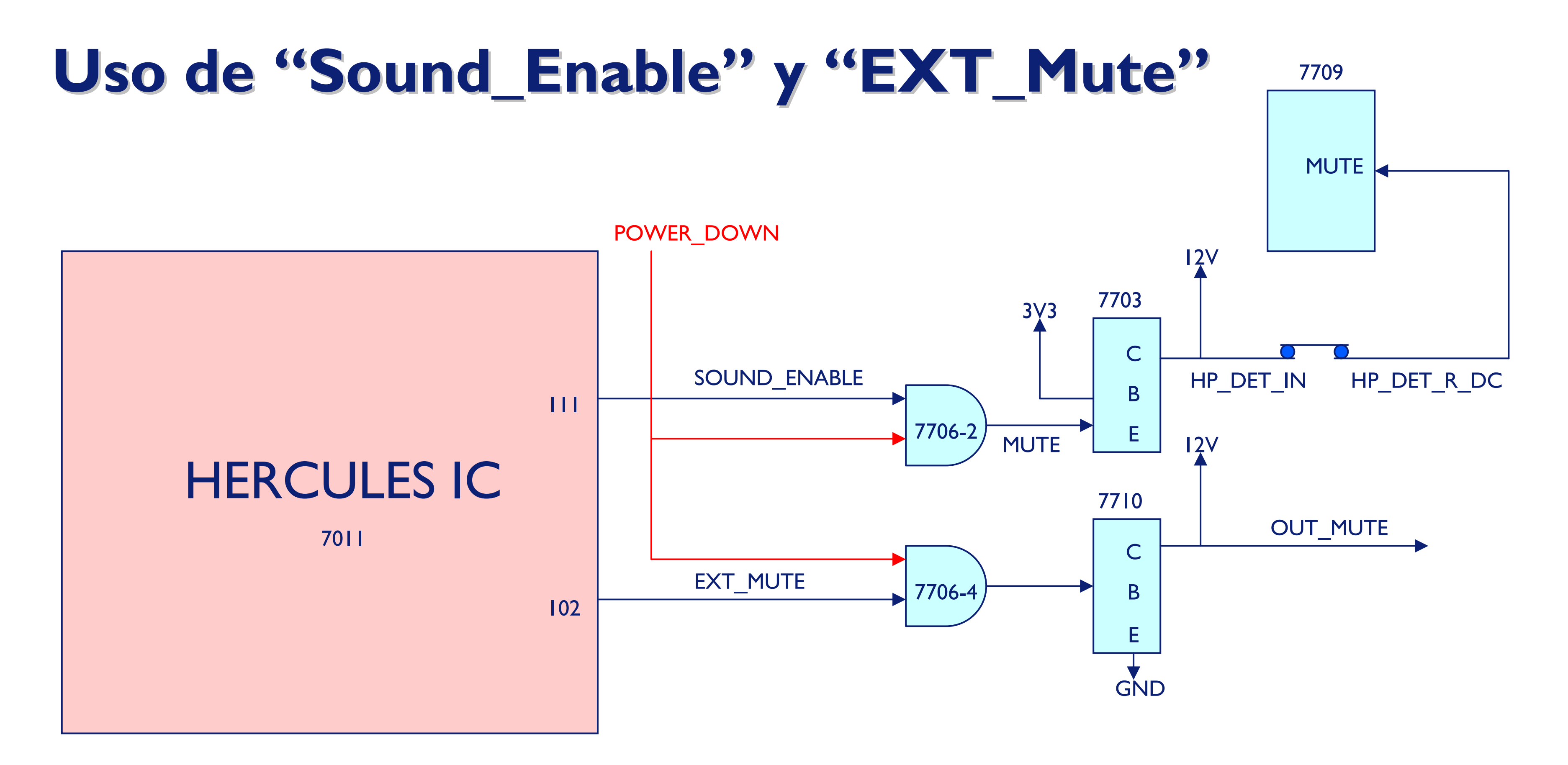


Diagrama de bloques selección de fuente de audio

Audio Entradas - Salidas



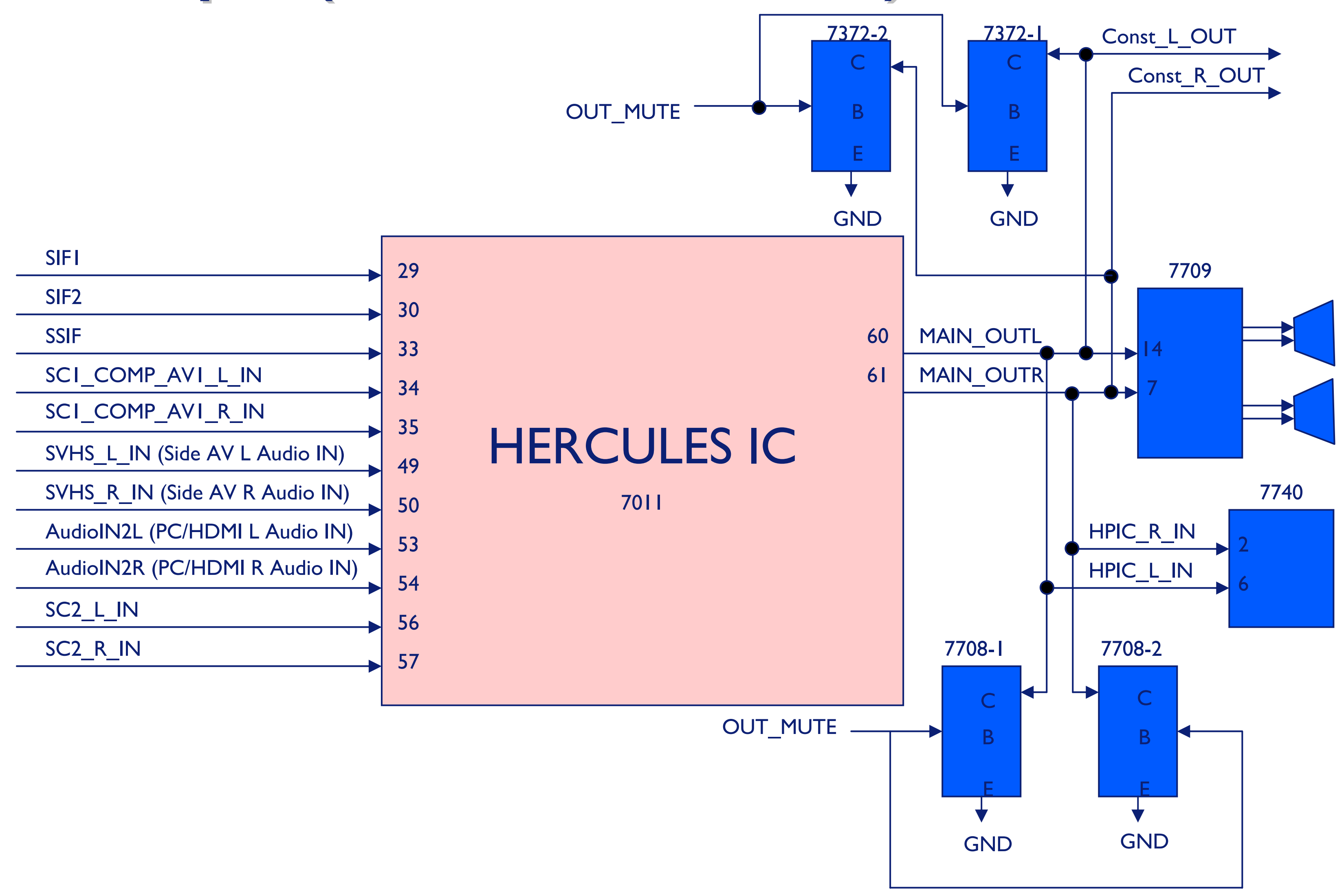
Uso de "Sound_Enable" y "EXT_Mute"



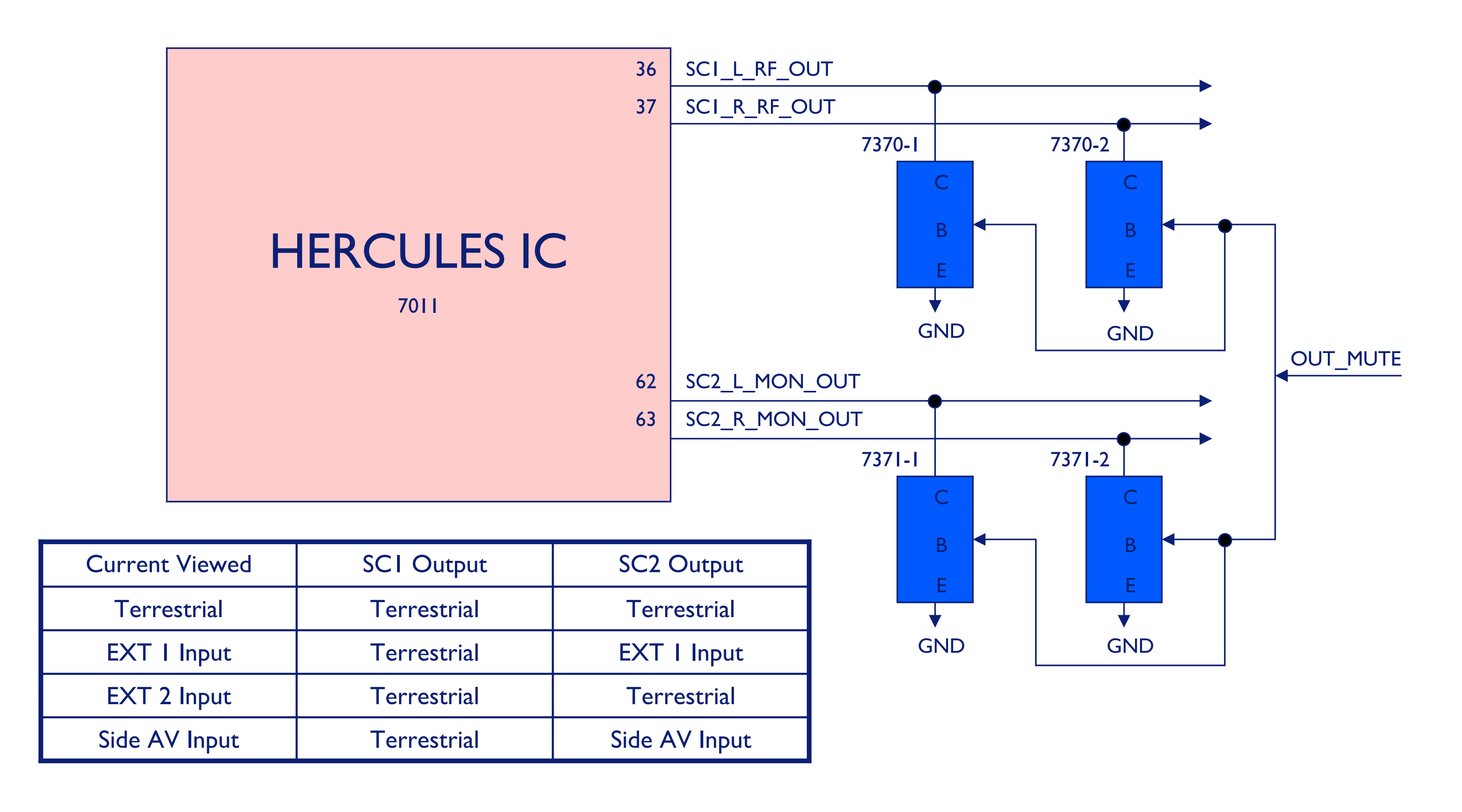
Sound Enable	Power Down	7706-2 O/P	7703 C
L	L	L	L
L	H	L	L
H	L	L	L
H	H	H	H

EXT MUTE	Power Down	7706-4 O/P	7710 C
L	L	L	H
L	H	L	H
H	L	L	H
H	H	H	L

Main Output (Salida de Altavoces)

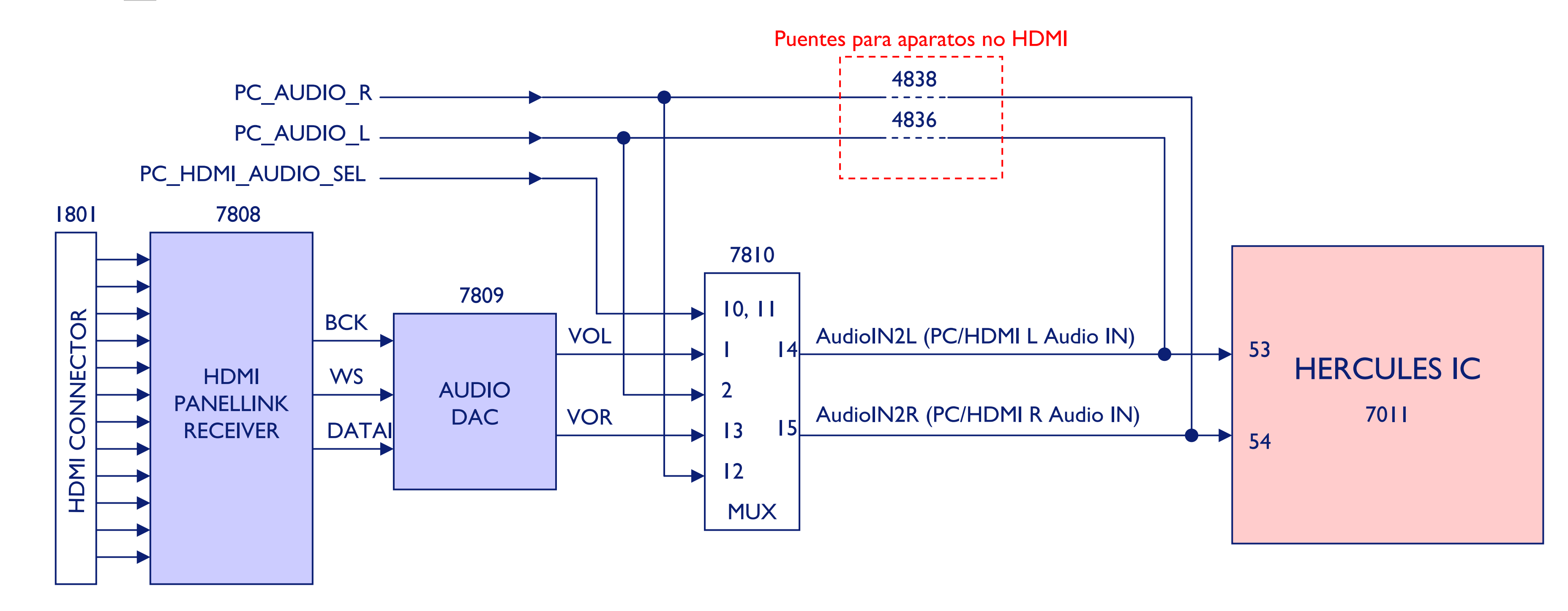


EXT Outputs (SC1, SC2, AV1, AV2)

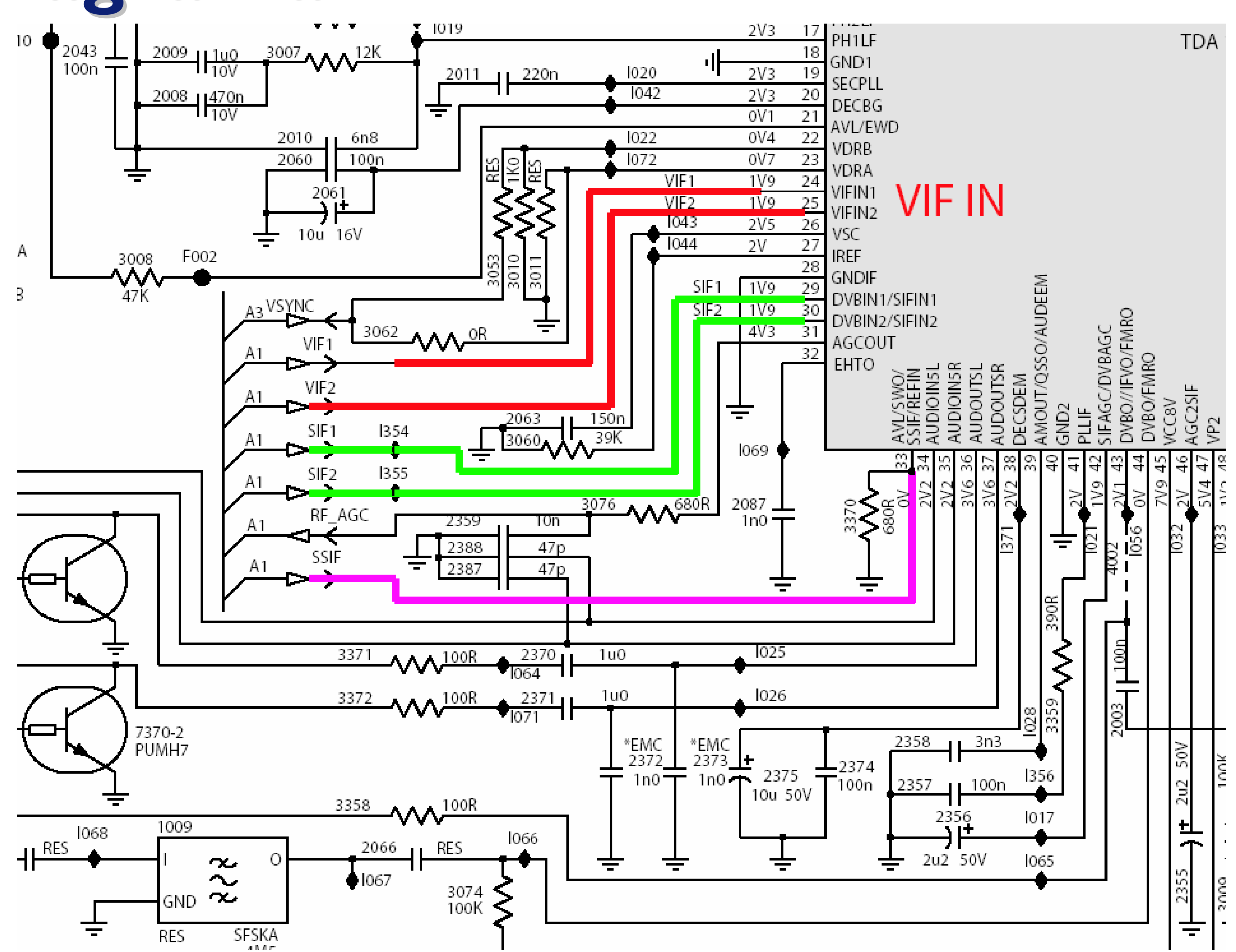


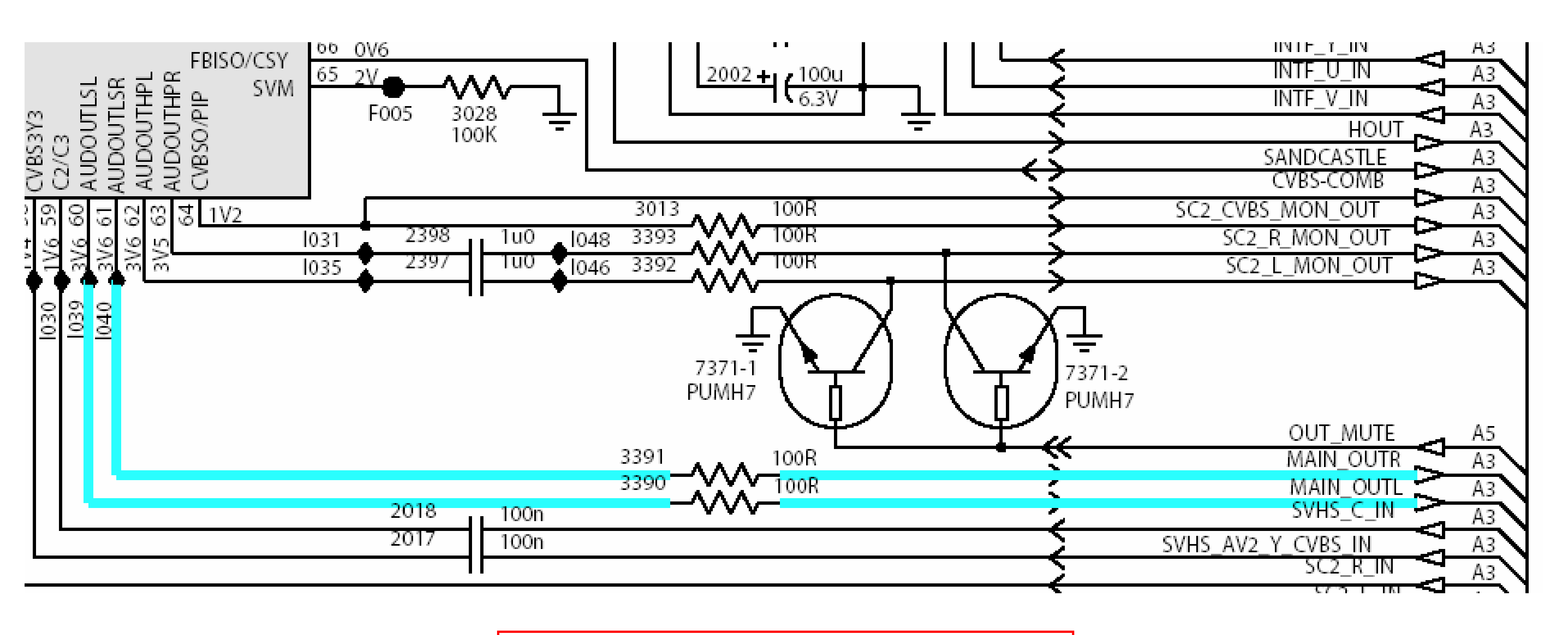
Current Viewed	SC1 Output	SC2 Output
Terrestrial	Terrestrial	Terrestrial
EXT 1 Input	Terrestrial	EXT 1 Input
EXT 2 Input	Terrestrial	Terrestrial
Side AV Input	Terrestrial	Side AV Input

PC_HDMI Circuito de Audio



Diagrama


TDA
PH1LF
GND1
SECPLL
DECBG
AVL/EWD
VDRB
VDRA
VIFIN1
VIFIN2
VSC
IREF
GNDIF
DVBIN1/SIFIN1
DVBIN2/SIFIN2
AGCOUT
EHTO
VIF IN
VIF1
VIF2
SIF1
SIF2
RF_AGC
SSIF
VSYNC
7370-2
PUMH7
1009
SFSKA
GND
RES



Salida al Amplificador.

PHILIPS

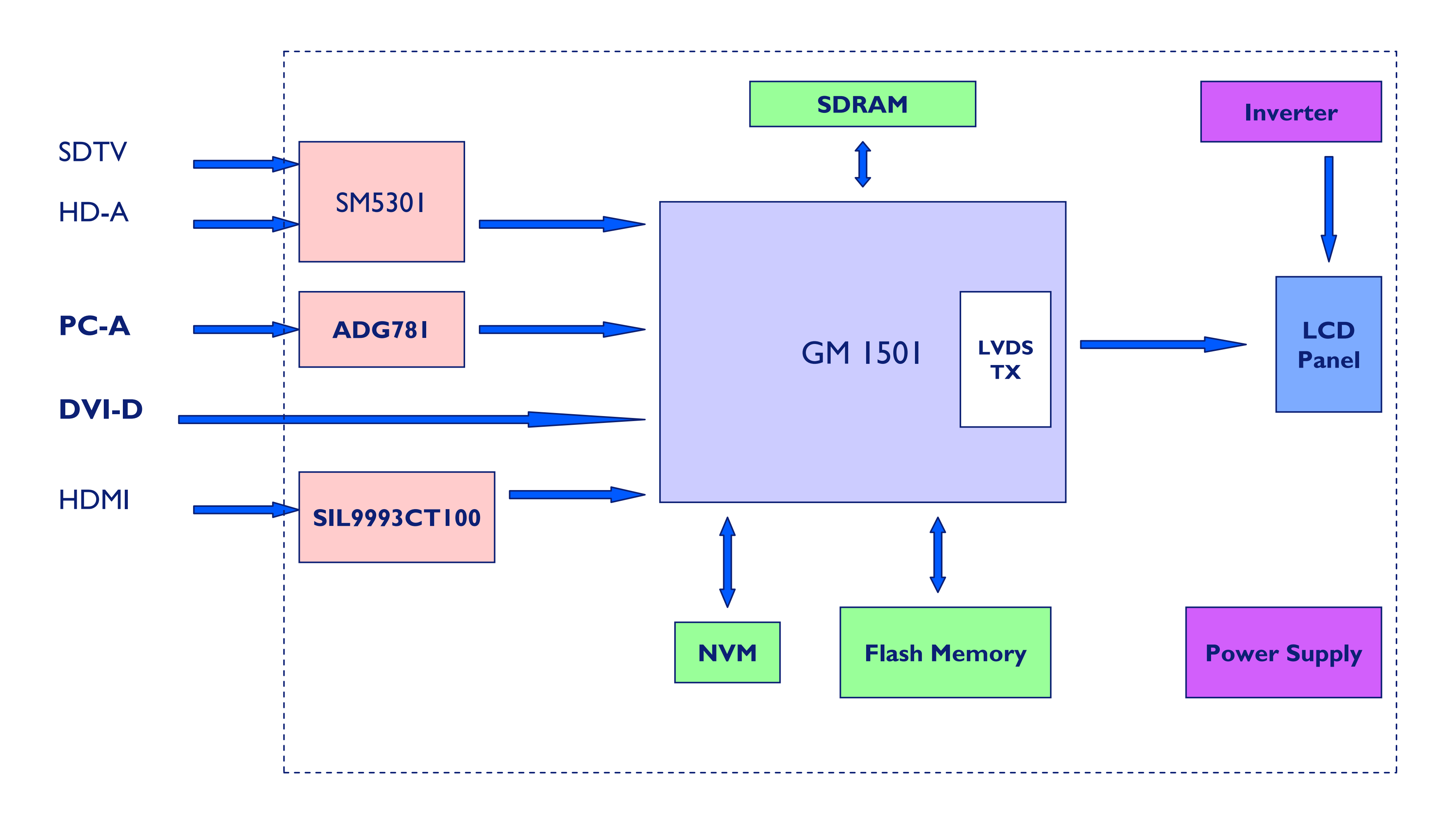
Curso LC04
07. Scaler del chasis LC4.2

Philips Ibérica – Electrónica de Consumo
Departamento Técnico
Cristina Senallé - Gabriel Arianes
Noviembre 2004

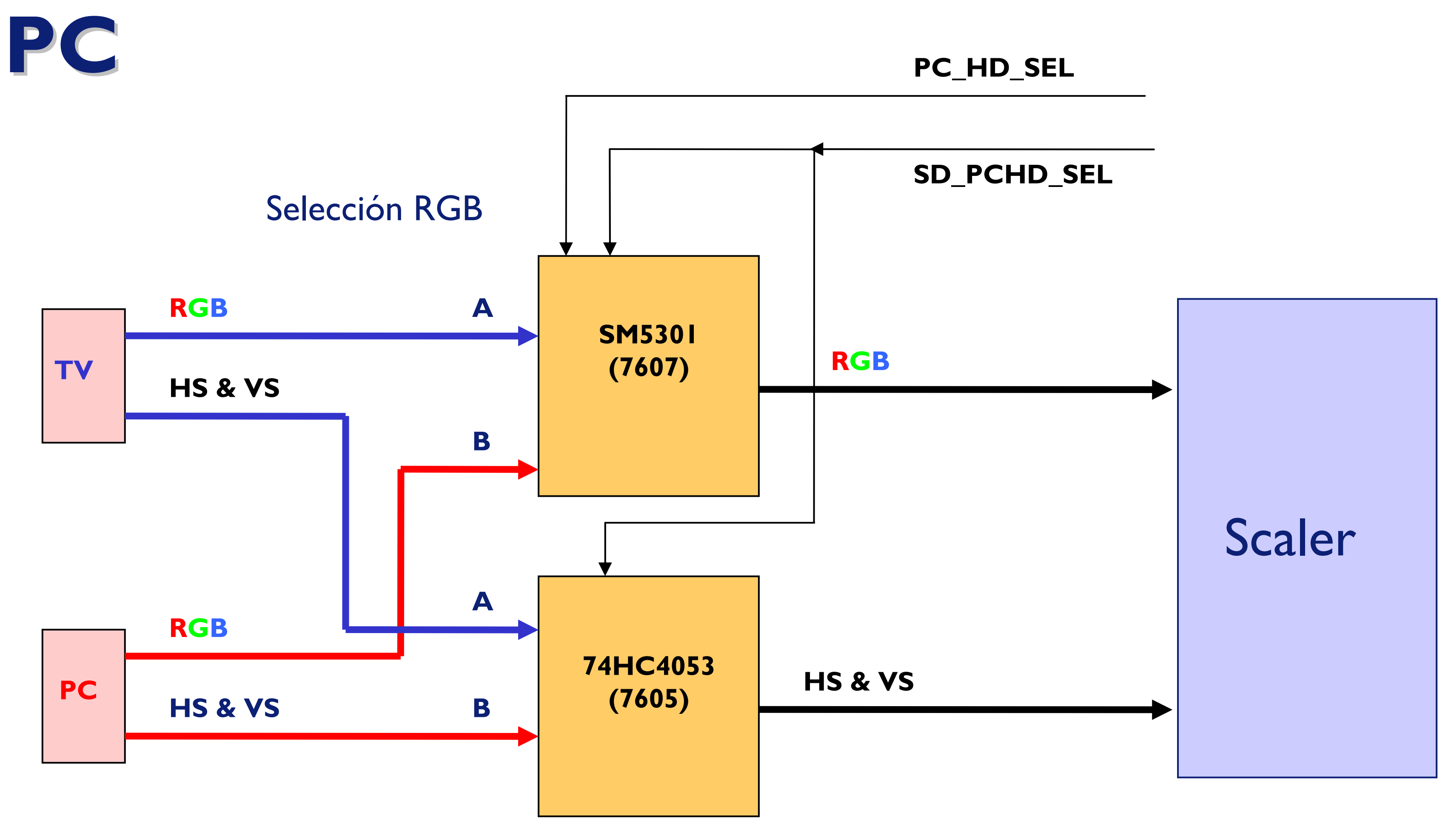
Información general del Scaler

- Las señales analógicas de gráficos y las señales HD analógicas se soportan a través del conector D-Sub
- Las señales digitales de gráficos y video se soportan a través del conector DVI, que está directamente conectado al integrado GM-1501.
- Las señales digitales HD y las señales de gráficos se soportan a través del conector HDMI.
- Las funciones de escalado y de-entrelazado se realizan en el integrado GM-1501
- Para la conversión de la tasa de cuadro se usa una SDRAM DDR 4Mx32.
- Para el firmware del sistema, se usa una Flash Rom de 512kx8.
- Conexión directa, a través de los transmisores LVDS, al panel LCD.

Diagrama de bloques del Scaler



Conmutación entre el modo TV & PC



Conmutación entre el modo TV & HD

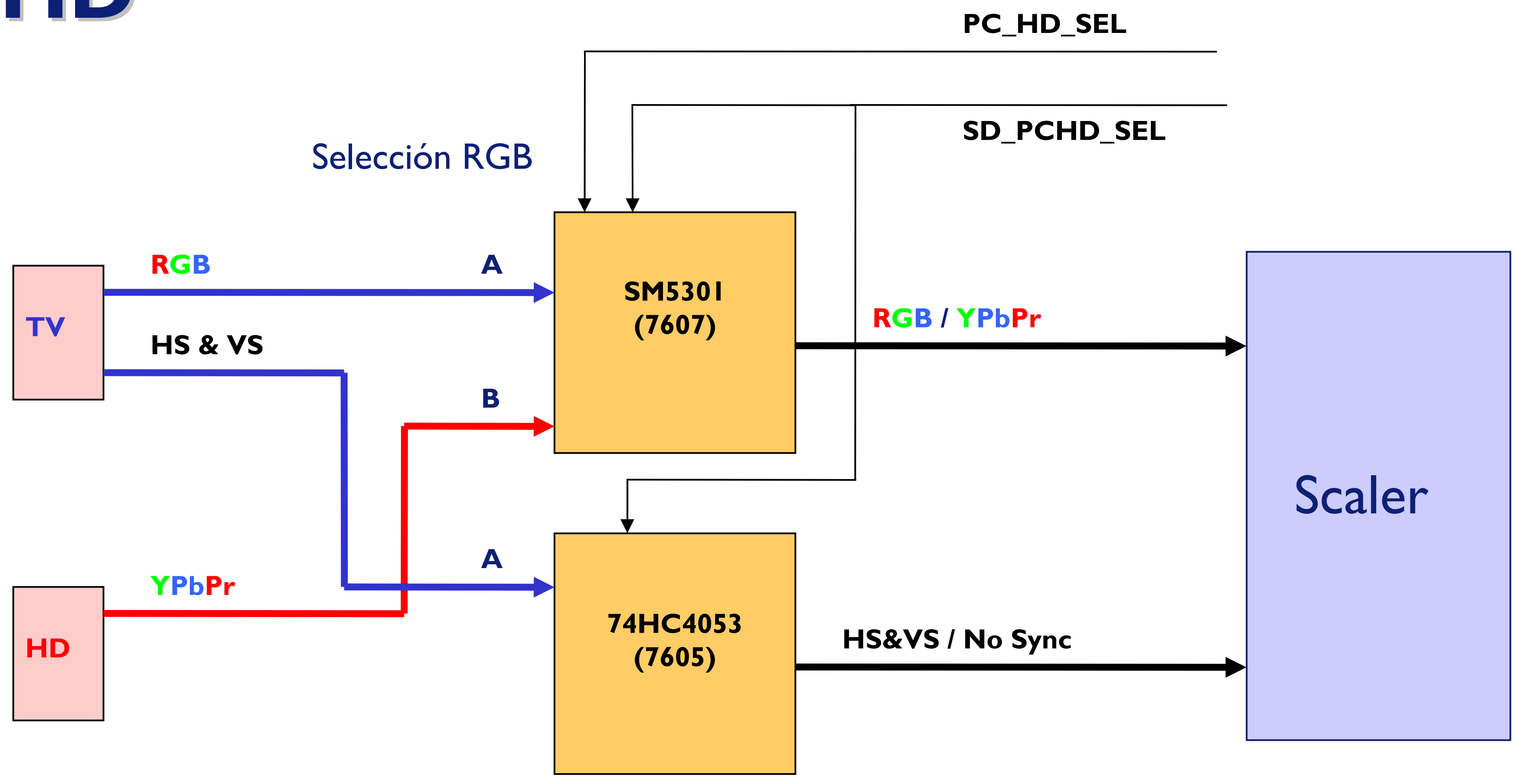
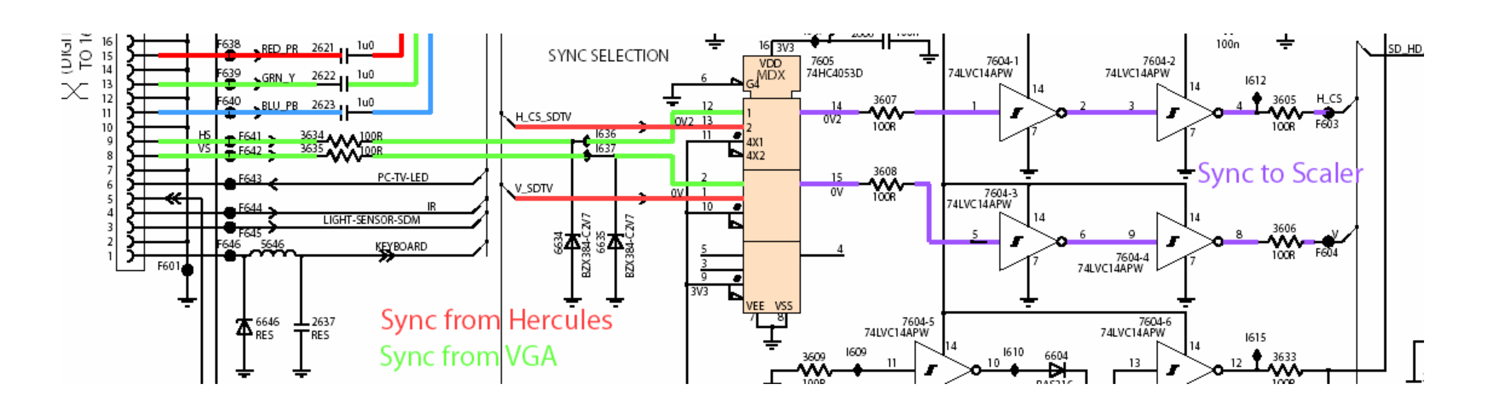
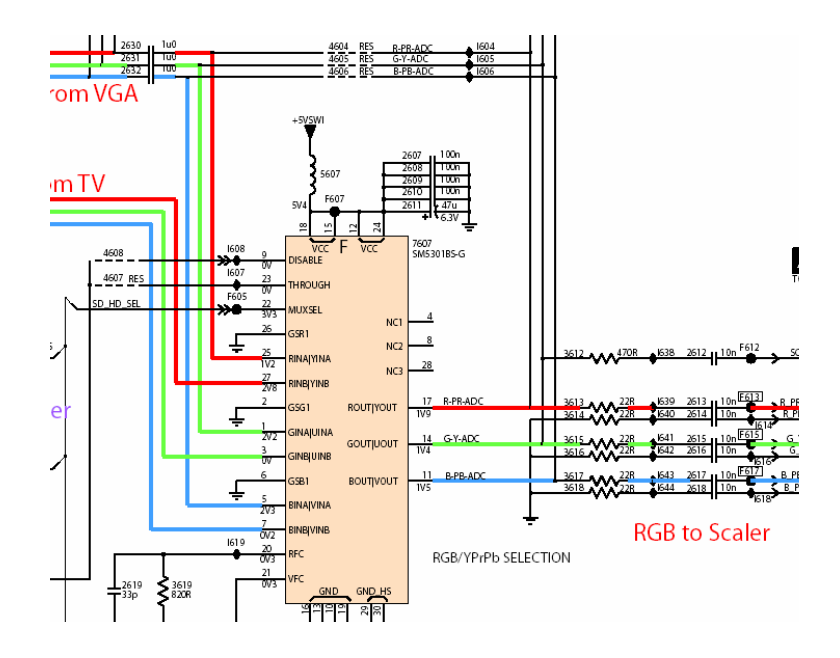
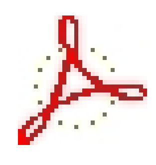


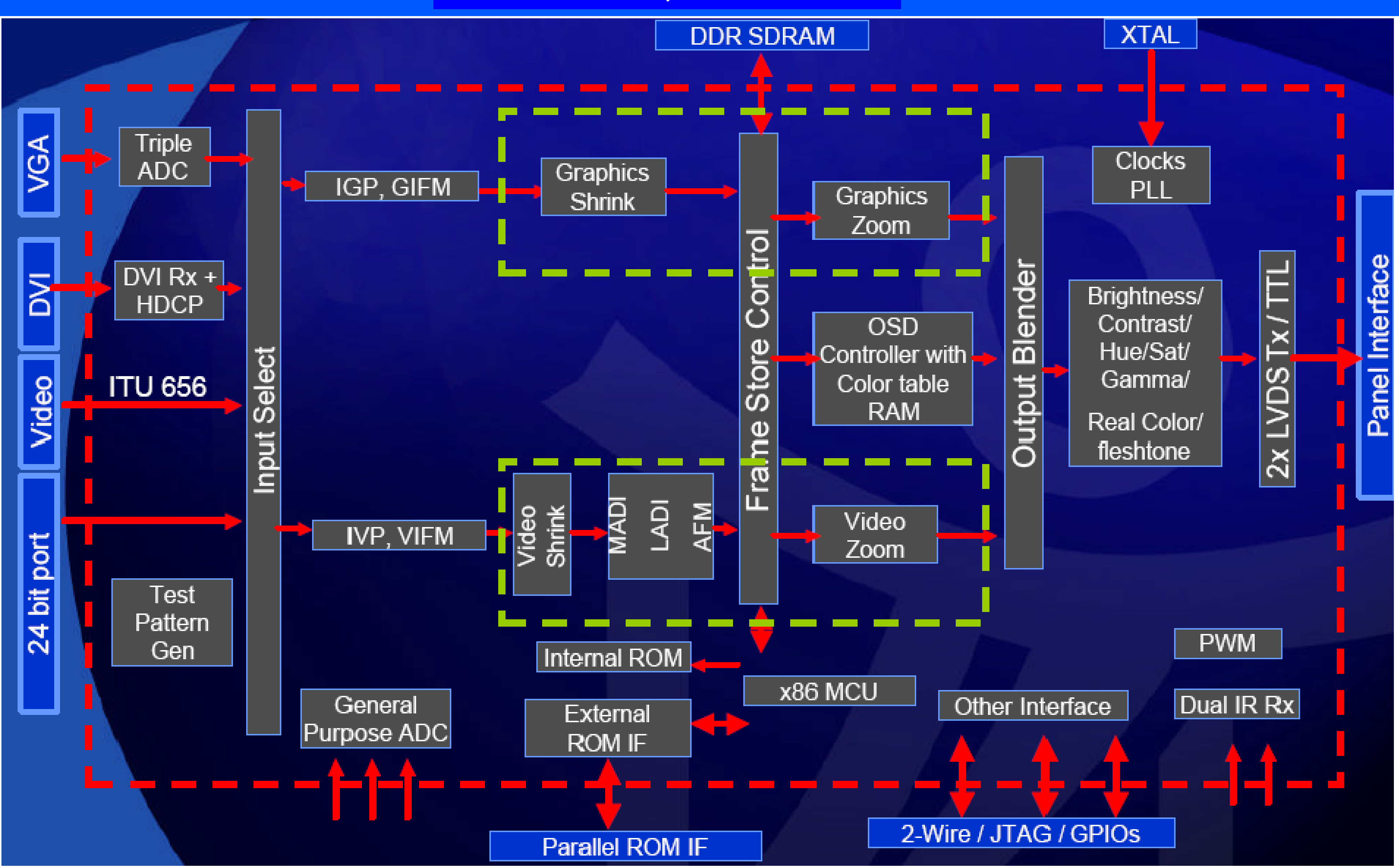
Diagrama selección RGB/Sync



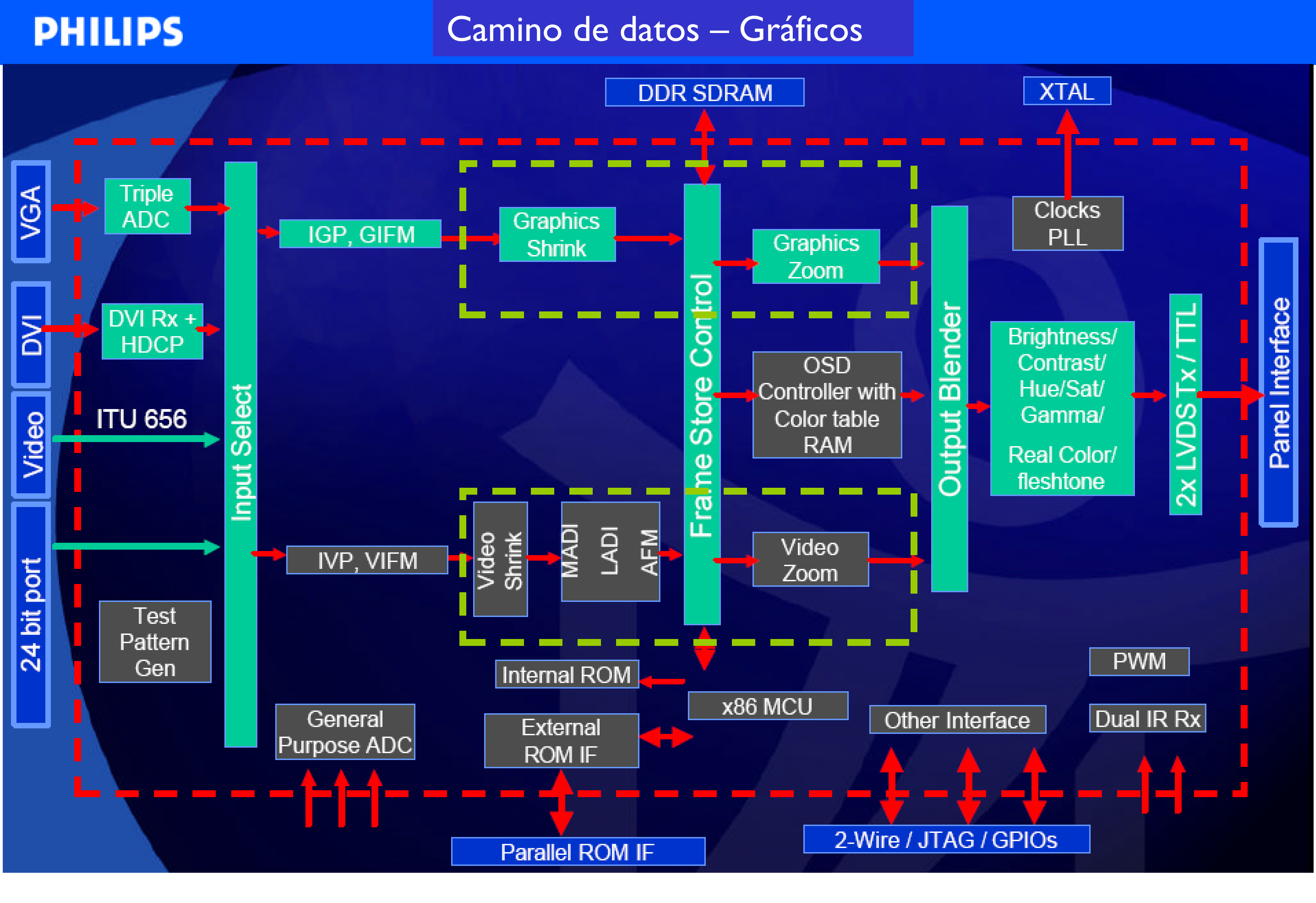




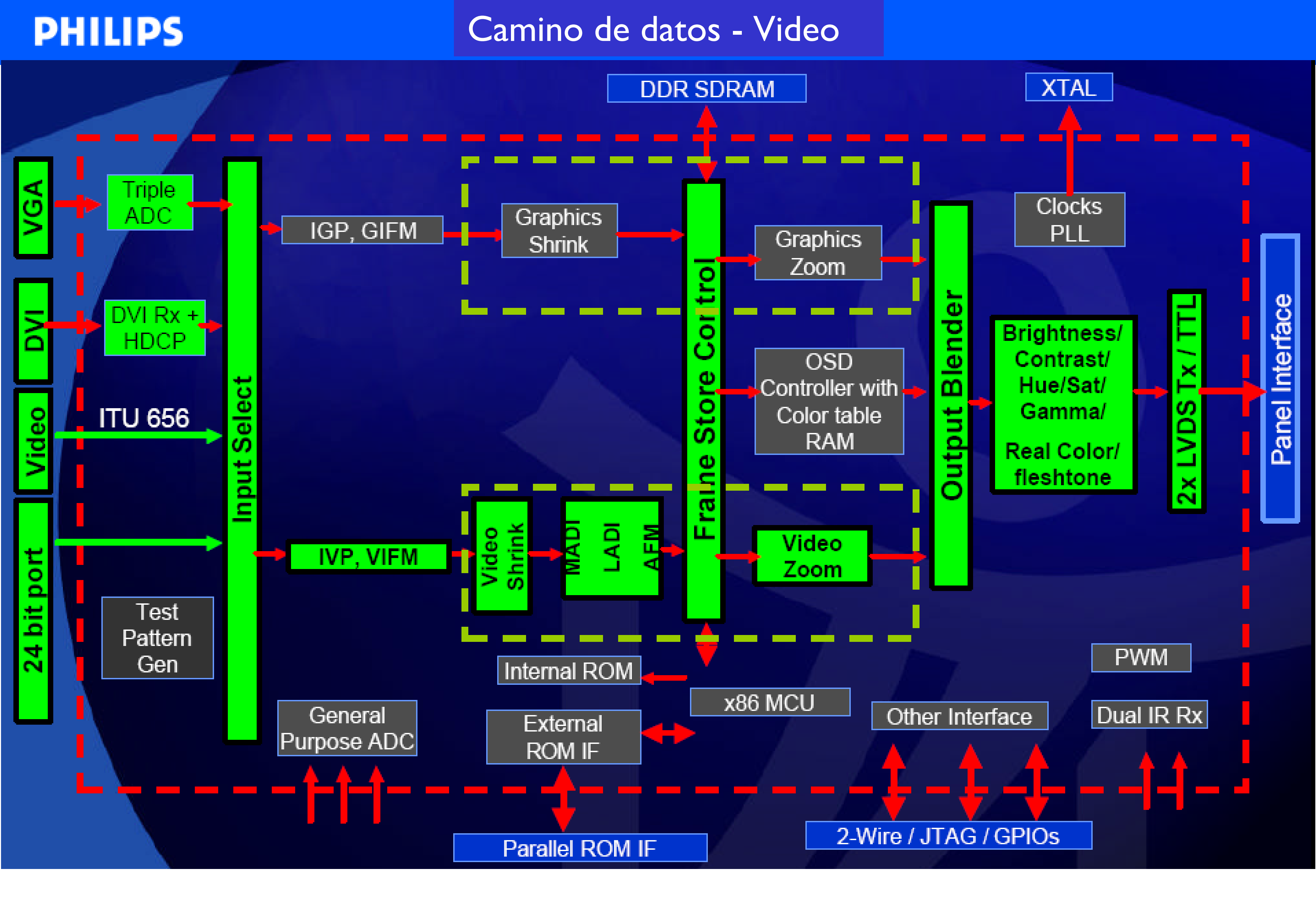
Gm 1501- Flujo de señal



Camino de datos – Gráficos



Camino de datos - Video



Test Flow

- Paso 1: Chequeo de la alimentación
- Paso 2: Chequeo del control de señal
- Paso 3: Chequeo de la señal de dato y sincronismo
- Paso 4: Chequeo de la señal de salida del Scaler



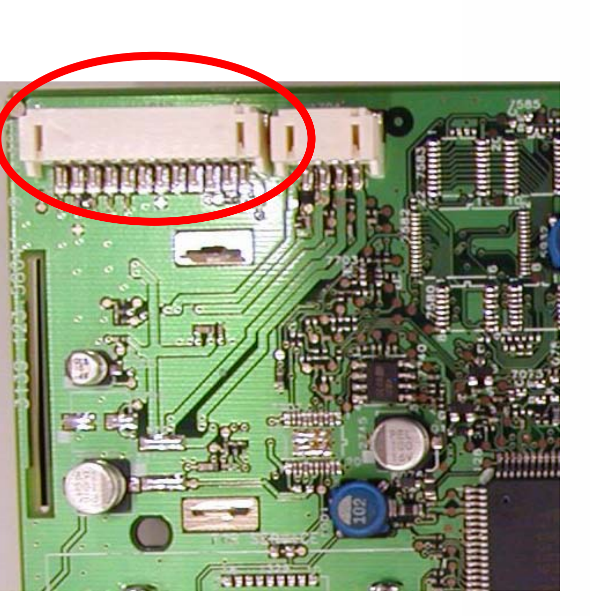
Paso 1: Chequeo de la alimentación

➢ Alimentación Scaler

Conector 1910

Pin 3 +3.3VSTBY **Pin 9** Power down

Pin 10 Standby **Pin 8** +12VSW



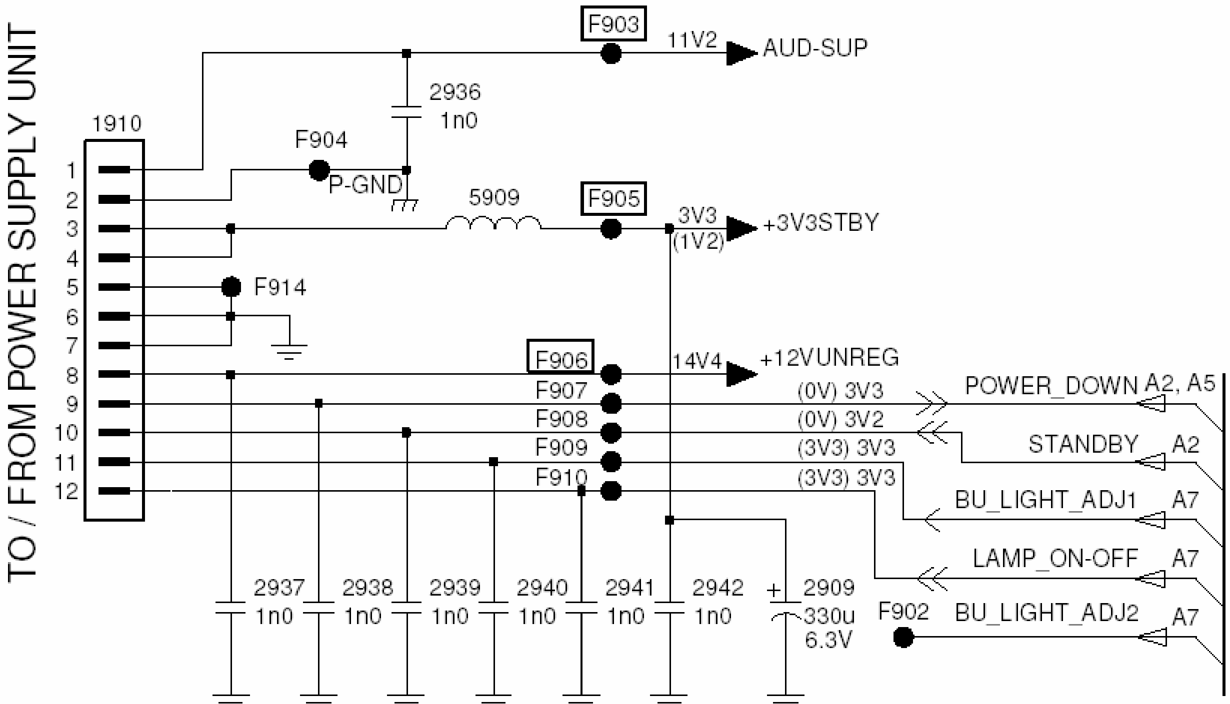
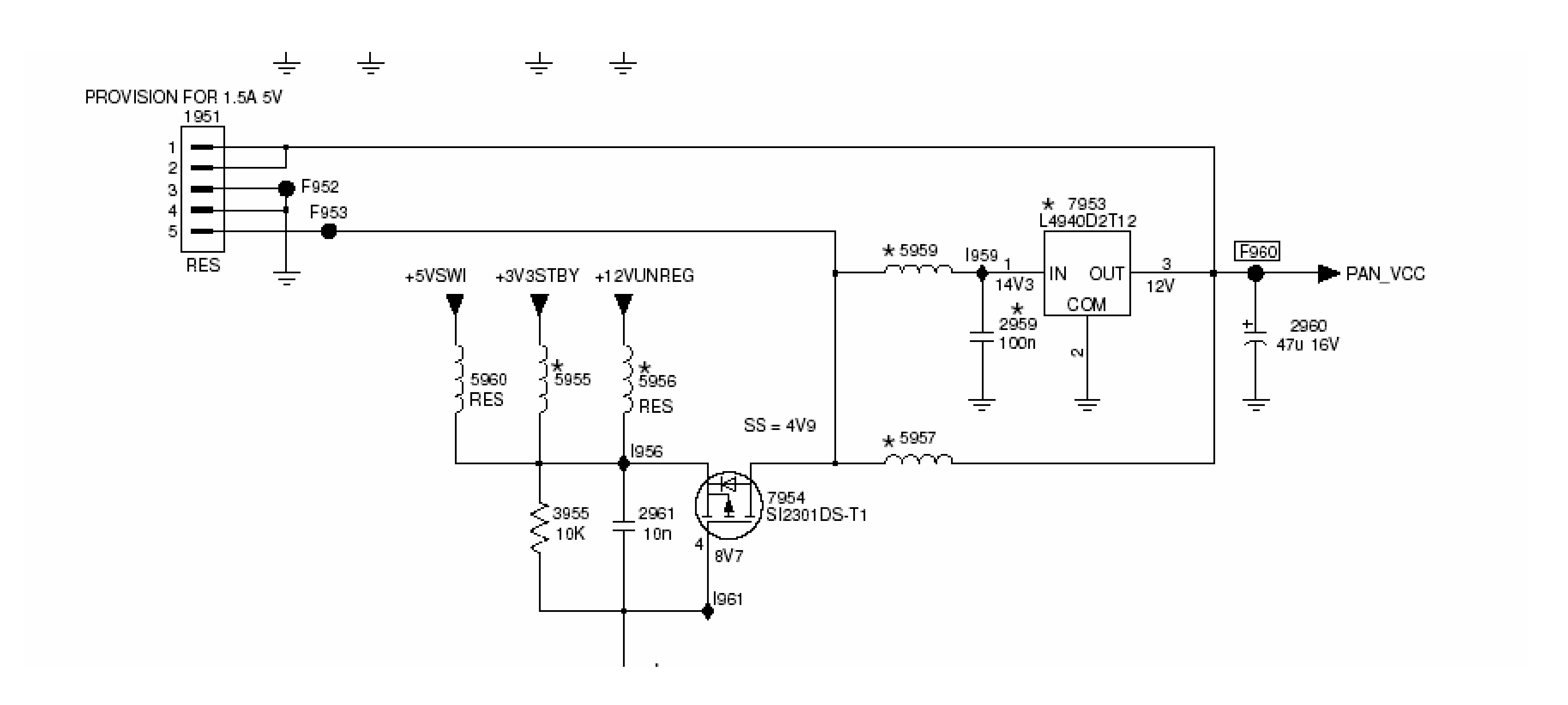


Diagrama A6

➢ Alimentación del panel LCD

Salida del *regulador 7953*



➢ Control de Backlight

Conector 1910

Pin 11 Backlight_adjust **Pin 12** Backlight_on_off

➢Power On Reset Check

Comprobar el pin 4 integrado de reset

7532

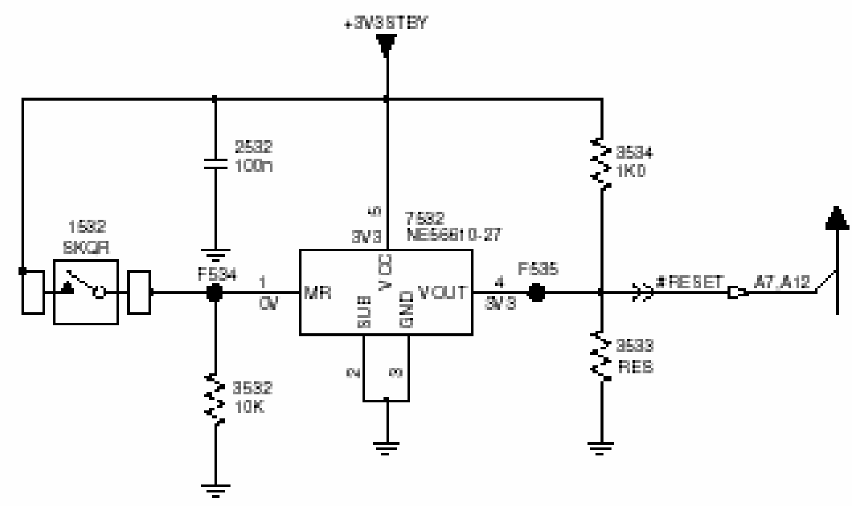
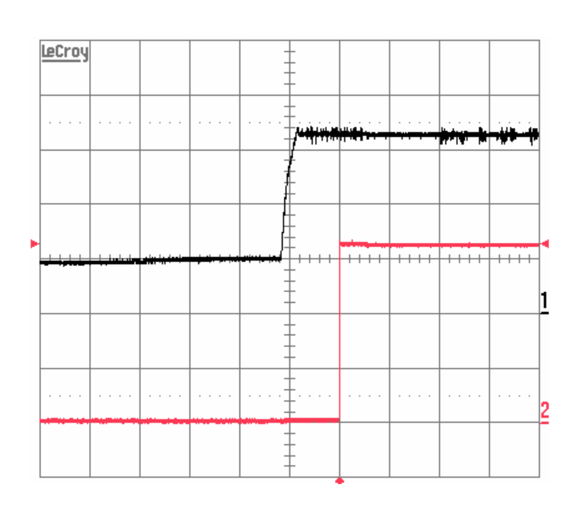
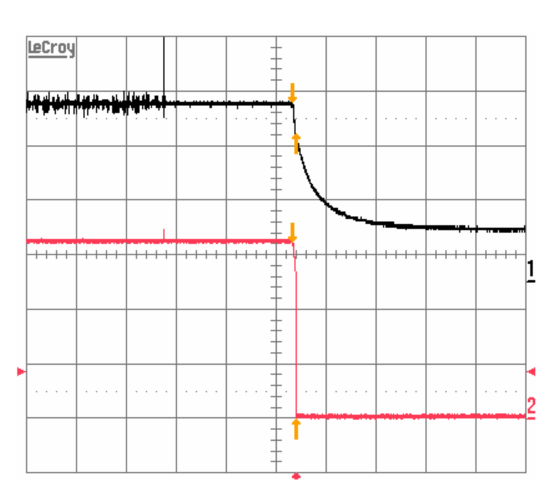
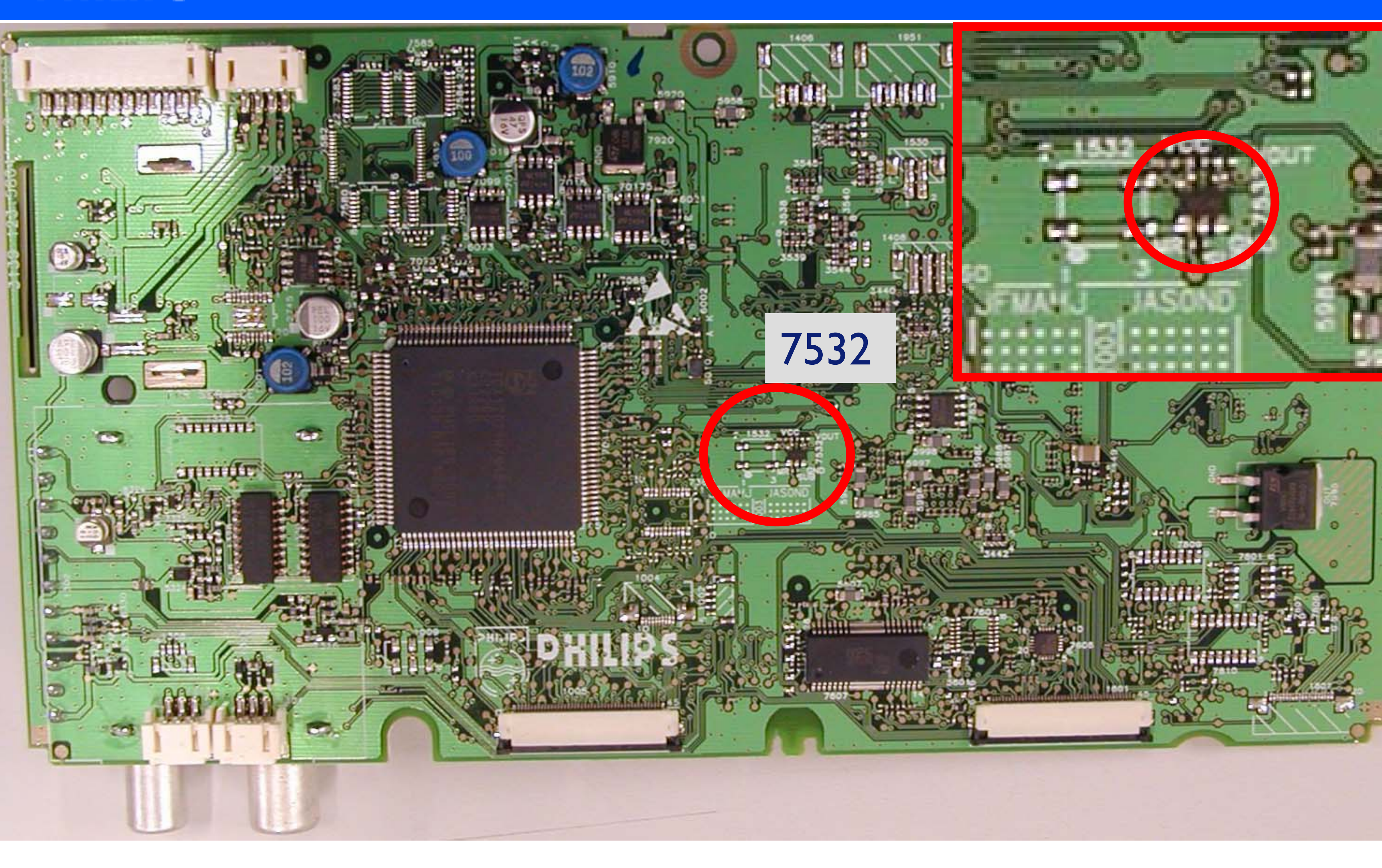


Diagrama A11





Al arrancar, el retardo de la salida del integrado de reset, con respecto +3V3STBY, es 50ms
Al apagar, el retardo de la salida del integrado de reset, con respecto +3V3STBY, es 3.8ms
El reset del Gm1601 se realiza manteniendo el pin RESET bajo un mínimo de 1µs.


7532
PHILIPS
1532
VOUT
JASOND

	Description	Test Location	Spec			Unit
1	DC Supply		Min	Ty p	Max	
1.1a	+12V main supply	1910		12		V
1.1b	+3V3STBY	1910		3.3		V
1.1c	AUD_SUP	1910		10		V
1.2a	+5VSWTV Regulator out	5932 and 2935		5		V
1.2b	+VTUN Regulator out	2911				V
1.2c	+5VSW Regulator out	2968 and 5954		5		V
1.3	+8VSW_TV Regulator out	7920 out and 2921				V
1.4	+2V5 Regulator out	7992 out		2.5		V
1.5	+1V8Regulator out	7995 out		1.8		V





Chequeo alimentación Scaler

- Paso 2: Chequeo de la señal de control
  - Actividad de la línea I2C (Hércules, Scaler NVM)
  - Scaler PROM (memoria flash)
- Paso 3: Chequeo de la señal de datos y sincronismo
  - Seguir el camino de señal de TV, HD & PC
  - Chequear la señal control de conmutación
- Paso 4: Chequeo de la señal de salida del Scaler
  - Salida LVDS (Low Voltage Differential Signal)
  - Salida TTL

Chequeos

- **Chequeo de la línea I2C**

  Para chequear la robustez de la línea I2C se deben comprobar los buses:

  1. Bus I2C entre el Scaler y el Hercules (pin 5-6 NVM 7099)
  2. Bus I2C entre el Scaler y la NVM del Scaler (pin 5-6 NVM 7531)

- **Chequeo interconexión Entrada/Salida**

  El objetivo es asegurar las siguientes condiciones de señal analógica y digital:

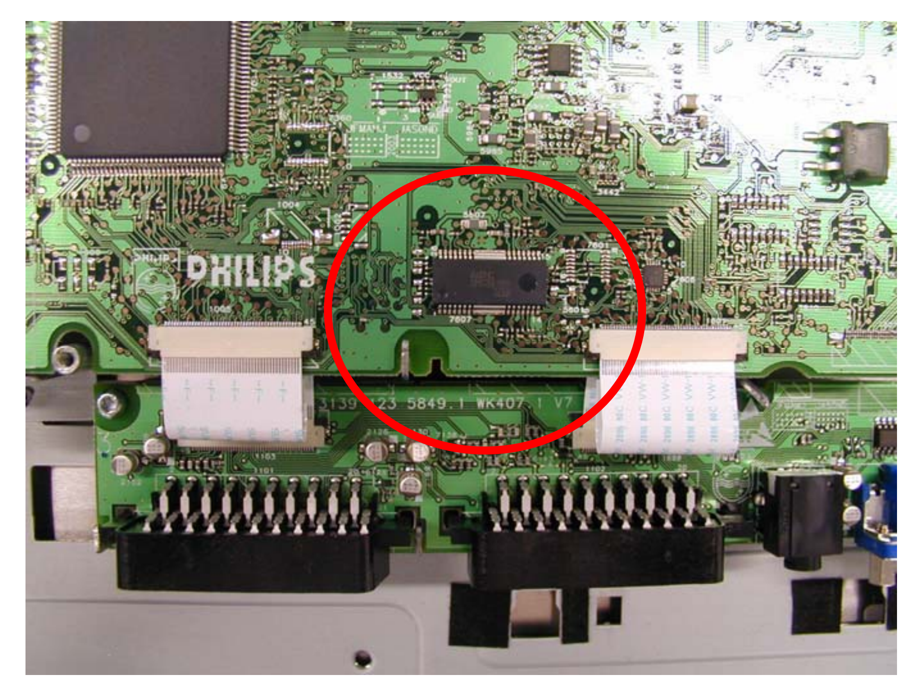
  - Asegurar que todos los niveles de tensión son correctos en todas las etapas.
  - Medir el ancho de banda de la entrada ADC.
  - Medir las líneas de sincronismo y de reloj en tiempo de subida y bajada, nivel y frecuencia.
  - Medir tiempos ajuste entre todos los dispositivos digitales

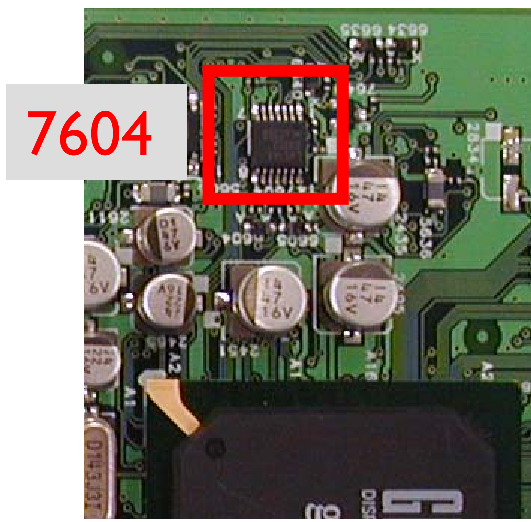
	SDTV input					
Condition: Patten#1 Gray Scale pattern at EXT1/AV1 input. PAL BG. SDTV Picture setting: Natural.						
	Description	Test Location	Specs			Unit
Scaler Input			Min	Typ	Max	
3.1a	R_SDTV input	7607 pin 17	680	700	710	mVpp
3.1b	R_SDTV input –3dB Bandwidth		5		8	MHz
3.2a	G_SDTV Input	7607 pin 14	680	700	710	mVpp
3.2b	G_SDTV input –3dB Bandwidth		5		8	MHz
3.3a	B_SDTV Input	7607 pin 11	680	700	710	mVpp
3.3b	B_SDTV input –3dB Bandwidth		5		8	MHz
3.5a	CS_H_SDTV freq	7604 pin 4		fH		KHz
3.5b	CS_H_SDTV level		3.0	3.3		Vpp
3.5c	CS_H_SDTV Tr				20	ns
3.5d	CS_H_SDTV Tf				20	ns
3.5e	CS_H_SDTV jitter				5	ns
3.6a	V_SDTV freq	7604 pin 8		fV		Hz
3.6b	V_SDTV level		3.0	3.3		Vpp
3.6c	V_SDTV Tr				20	ns
3.6d	V_SDTV Tf				20	ns

Sync Signal Timing and Clamping Check

Condition: Patten#3 1Vpp CVBS video at RF and AV input. White Pattern. It should be tested under low to high temperature conditions.

	Description		Specs					
	HS Clamping period	7604 pin 4	2		7	µs	6.2	
	VS width	7604 pin 8	3H		12 H	µs	202us ≅ 3.2H	The sync width, leading edge and falling edge should not vary within a system





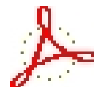
+5VSWI
5607
5V4
F607
2607 100n
2608 100n
2609 100n
2610 100n
2611 47u 6.3V
18 15 12 24
VCC Φ VCC
7607
SM5301BS-G
I608 9 0V DISABLE
I607 23 0V THROUGH
7607
F605 22 3V3 MUXSEL
26 GSR1
25 1V2 RINA|YINA
27 2V8 RINB|YINB
2 GSG1
1 2V2 GINA|UINA
3 0V GINB|UINB
6 GSB1
5 2V3 BINA|VINA
7 0V2 BINB|VINB
I619 20 0V3 RFC
21 0V3 VFC
NC1 4
NC2 8
NC3 28
ROUT|YOUT 17 1V9 R-PR-ADC
GOUT|UOUT 14 1V4 G-Y-ADC
BOUT|VOUT 11 1V5 B-PB-ADC
3612 47
3613 2
3614 2
3615 2
3616 2
3617 2
3618 2
GND GND_HS
16 13 10 19 29 30
F608
F620
3620

RGB/YPrPb SELECTION

	HDTV input							
Condition: Patten#2 100% color bar at HD input. 1280x720p@50Hz. HD Picture setting: Brightness 50, Contrast 90, Color 50, Sharpness Medium, Input Source: 1) from D-sub connector; 2) from DVI connector (only check the functionality)								
	Description	**Test Location**	**Specs**			**Unit**	**Results**	**Remarks**
Scaler			**Min**	**Typ**	**Max**			
4.1a	RED/Pr Input	7607 pin 25			700	mVpp		
4.1b	RED/Pr input –3dB Bandwidth		30			MHz		
4.2a	GREEN/Y Input	7607 pin 1			700	mVpp		
4.2b	GREEN/Y input –3dB Bandwidth		30			MHz		
4.3a	BLUE/Pb Input	7607 pin 5			700	mVpp		
4.3b	BLUE/Pb input –3dB Bandwidth		30			MHz		
4.5	SOG level			3.3		V		
4.5a	SOG Tr	7607 pin 14			20	ns		
4.6b	SOG Tf				20	ns		

	Description	Test Location	Spec			Unit
1	DC Supply		Min	Typ	Max	
1.1a	+12V main supply	1910		12		V
1.1b	+3V3STBY	1910		3.3		V
1.1c	AUD_SUP	1910		10		V
1.2a	+5VSWTV Regulator out	5932 and 2935		5		V
1.2b	+VTUN Regulator out	2911				V
1.2c	+5VSW Regulator out	2968 and 5954		5		V
1.3	+8VSW_TV Regulator out	7920 out and 2921				V
1.4	+2V5 Regulator out	7992 out		2.5		V
1.5	+1V8Regulator out	7995 out		1.8		V





Test de señales de entrada de PC al Scaler

SDRAM

Condition: Patten#1 Gray Scale pattern at PC input. 1024x768@60Hz. PC Picture setting: Brightness 100, Contrast 100, Color 50, Sharpness 50.

	Description	Test Location	Specs			Unit	Results	Remarks
			Min	Typ	Max			
7.1a	FSCLK+ level	7501 pin 55	0.98	1.25	1.51	V		
7.1b	FSCLK+ freq				200	MHz		
7.2a	FSCLK+ setup time							
7.2b	FSCLK+ hold time							
7.3	Check any one data line	7501 data lines		[1]				

Apéndice

Información de pines de conectores

- **Conector Sub-D de 15 pines**

PIN	SIGNAL
1	RED
2	GREEN
3	BLUE
4	NC
5	GND
6	RED GND
7	GREEN GND
8	BLUE GND
9	+ 5V SUPPLY FROM PC
10	SYNC GND
11	SENSE GND
12	SDA
13	H- SYNC
14	V- SYNC
15	DATA CLOCK

• Conector DVI de 24 pines

Pin	Signal Assignment	Pin	Signal Assignment	Pin	Signal Assignment
1	T.M.D.S Data2-	9	T.M.D.S Data1-	17	T.M.D.S Data0-
2	T.M.D.S Data2+	10	T.M.D.S Data1+	18	T.M.D.S Data0+
3	T.M.D.S Data2/4 Shield	11	T.M.D.S Data1/3 Shield	19	T.M.D.S Data0/5 shield
4	NC	12	NC	20	NC
5	NC	13	NC	21	NC
6	DDC Clock	14	+5V Power	22	T.M.D.S Clock Shield
7	DDC Data	15	Hot Plug Detect	23	T.M.D.S Clock+
8	NC	16	Ground (return for +5 V)	24	T.M.D.S Clock-

PHILIPS

Curso LC04
08. Sistema

Philips Ibérica – Electrónica de Consumo
Departamento Técnico
Cristina Senallé - Gabriel Arianes
Noviembre 2004

Sistema de control

El sistema de buses de la placa tiene dos microprocesadores integrados:

• Embedded **x86** on-chip micro-controller (OCM) de Genesis LCD TV/Monitor Controller.
• On-chip **80C51** micro-controller de la serie UOC^{III} (Hercules) de Philips Semiconductor.

Cada microprocesador tiene su propio bus I^{2}C para comunicación con los dispositivos internos. Los dispositivos externos se comunican a través de los buses **I^{2}C** listados a continuación.

Buses I2C

Bus I2C-1: es un bus hardware I2C donde el UOCIII es el master. Los siguientes dispositivos están conectados a este bus:

- El sintonizador TV/FM analógico principal
- La NVM de la TV (EEPROM)
- Integrado de Histograma
- Herramienta de Compair (sólo Hercules)
- Sólo para NATFA, un 3D-Combfilter opcional
- El OCM. El OCM se comunica con el UOCIII como esclavo. Para evitar una sobrecarga en el buffer en el lado del OCM, la línea TV_SC_COM proporciona el control necesario. Para permitir comunicación bidireccional, el OCM puede efectuar una petición de interrupción al UOCIII a través de la línea TV_IRQ.

Bus I2C-2: es un bus software I2C en el que el UOCIII es el master. Este bus se usa para conectar módulos bolt-on externos como módulos DVB o módulos ATSC.

Bus I2C-3: es un interface DDC I2C esclavo en el SiI9993. Una fuente externa HDMI conectada al conector HDMI es, normalmente, el master de este bus.

Bus I2C-4: el OCM es el master de este bus. La EEPROM (Scaler) y el receptor HDMI PanelLink (SiI9993) están conectados a este bus.

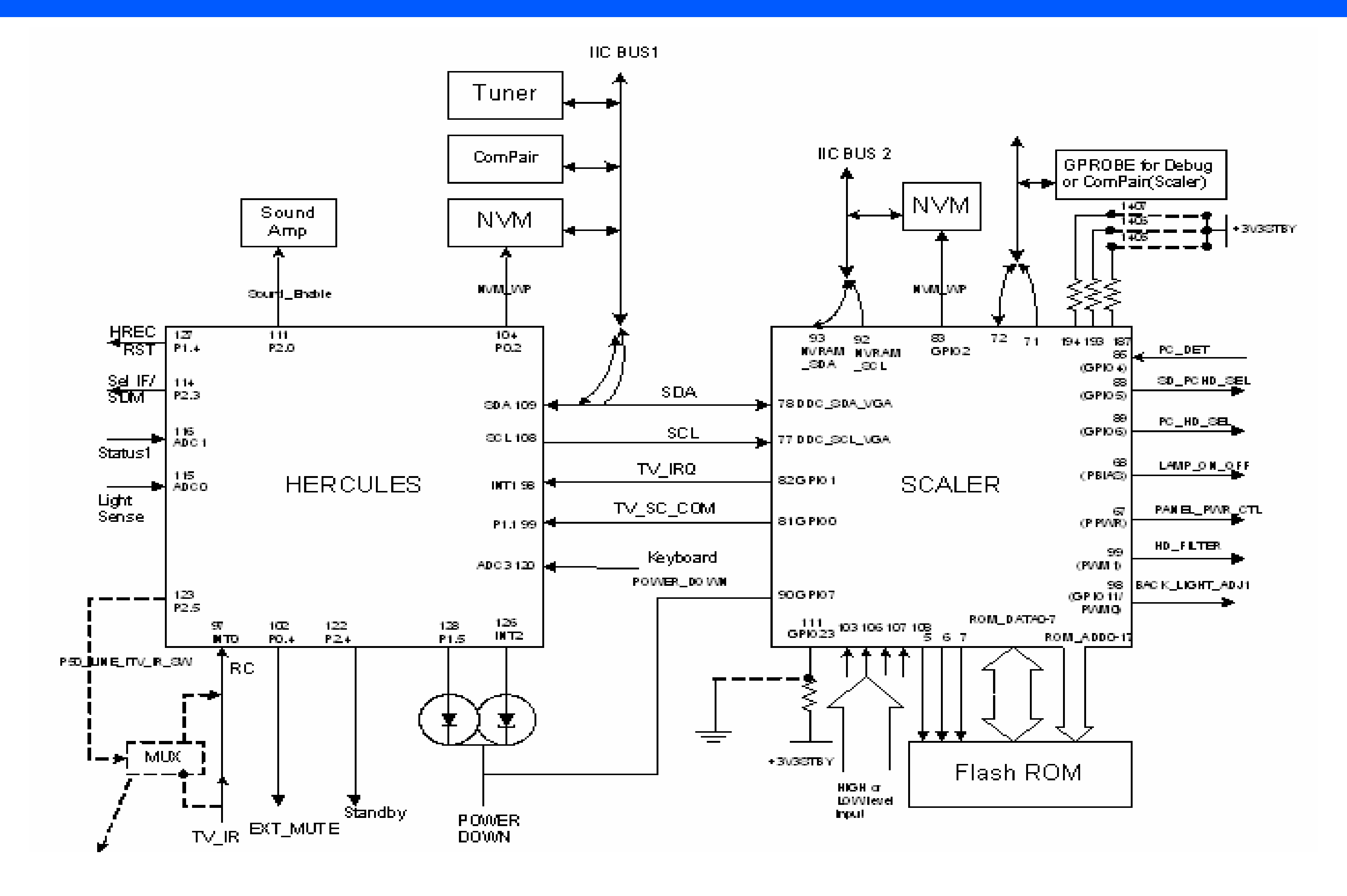
Bus I2C-5: es el interface DDC para comunicaciones DDC2B desde un conector DVI-D. La fuente DVI normalmente es el master de este bus.

Bus I2C-6: sólo se usa en la fase de desarrollo para depurar el software.

Bus I2C-7 ComPair-Scaler: bus UART que se usa para diagnósticos de servicio en la parte del Scaler.

Bus I2C-8 VGA: bus DDC VESA que permite al PC leer la EEPROM que contiene la información EDID del monitor-TV LCD.





Interface del microprocesador

PHILIPS

Curso LC04
09. Chasis LC4.6

Philips Ibérica – Electrónica de Consumo
Departamento Técnico
Cristina Senallé - Gabriel Arianes
Noviembre 2004

PHILIPS

Curso LC04
09A. Introducción LC4.6

Philips Ibérica – Electrónica de Consumo
Departamento Técnico
Cristina Senallé - Gabriel Arianes
Noviembre 2004

Chasis LC4.6

- Referencia: **xxPF9946/yy**
- Tecnología:
  - LCD : 30”
  - PDP : 37” y 42”
- Regiones:

  Europa (/12)

  AP (/61, /69, /79, /93, /98)

  NAFTA (/37)

Resolución de la pantalla

- **LCD 30"**

AUO :	1280x768	(Europa)
LG(C5) :	1280x768	(NAFTA)

- **PDP 37"**

SDI : 852x480

- **PDP 42"**

SDI : 852x480

Especificaciones (Europa)

- Audio : 2 x 15 W
- Modos de sonido:
  - Mono
  - Espacial
  - Estereo
  - Nicam / Dual I-II
  - Virtual Dolby surround
- Active control plus (con sensor de luz)
- 10 páginas de TXT
- Pantalla Twin-TXT (no dual teletexto)
- Plug ‘n play
- Mando para controlar 5 dispositivos

Limitaciones de software (Europa)

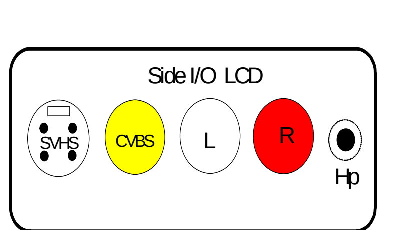
Debido a la ROM de 128Kb del Hercules:

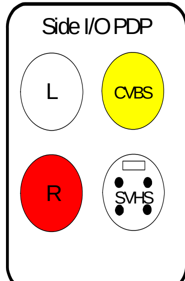
- No TXT nivel 2.5
- No hue menu line
- Sin nombres en las presintonías
- Sin desplazamiento vertical de la imagen
- No se muestra .25Hz en las frecuencias de los canales
- Un único ‘deltavolume” para presintonías del 41 al 99

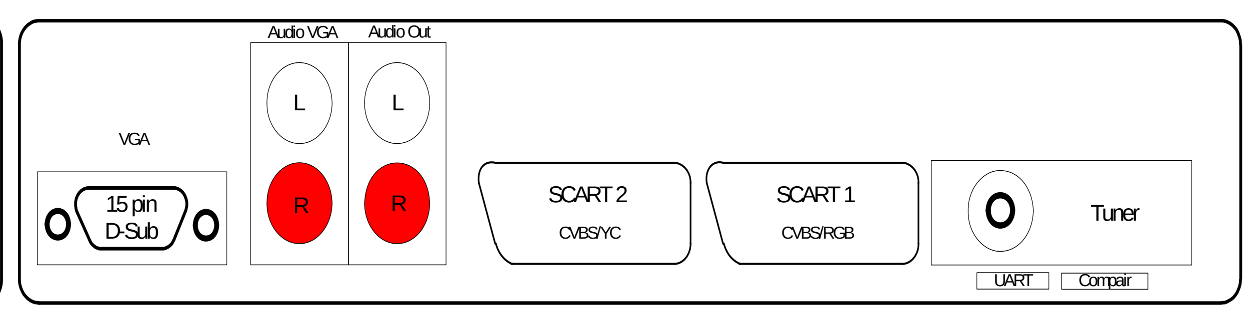
Modos de servicio

- **SDM**:
  - Entrada: 062596 + ‘Menu’
  - Información: errores (borrado si se entra cortocircuitando los pines de servicio)
- **SAM**:
  - Entrada: 062596 + ‘i+’
  - Información: errores/códigos opción/alineamientos
- **CSM**:
  - Entrada: 123654
  - Información: general y de los ajustes actuales

Conexiones


Side I/O LCD
SVHS
CVBS
L
R
Hp


Side I/O PDP
L
CVBS
R
SVHS

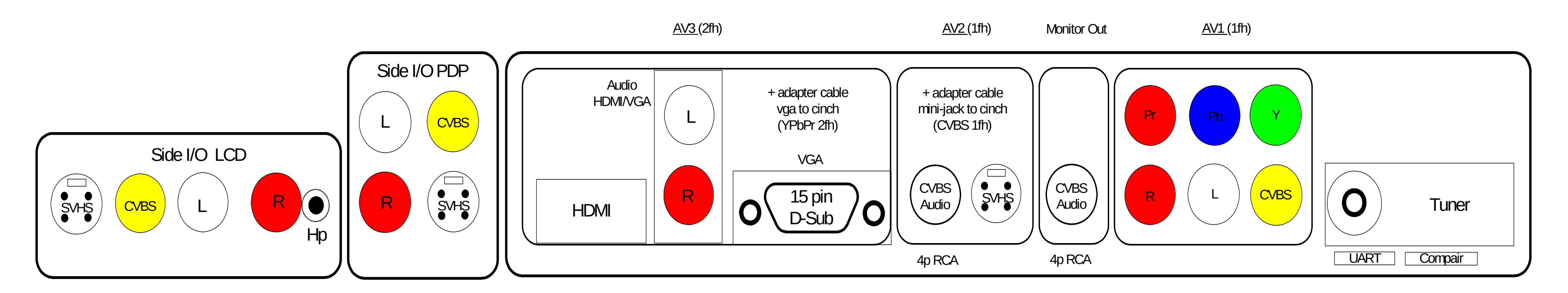

VGA
15 pin
D-Sub
Audio VGA
L
R
Audio Out
L
R
SCART 2
CVBS/YC
SCART 1
CVBS/RGB
Tuner
UART
Compair

Conexiones

- **Modo TV**
  - Sintonizador
  - Euroconector 1:
    - Entrada RGB
    - Entrada/salida CVBS
  - Euroconector 2 :
    - Entrada YC
    - Entrada/salida CVBS
  - Conector lateral/posterior :
    - Entrada CVBS
    - Entrada SVHS + audio
    - Salida de audio de nivel variable

- **Modo PC**
  - Entrada VGA + Audio

Conexiones cinch



Conexiones cinch

- **Modo TV**
  - AV1: entrada CVBS + audio
  - CVI : entrada YPbPr + audio
  - AV2: entrada CVBS/SVHS + audio (adaptador)
  - Salida monitor: salida CVBS + audio (adaptador)
  - Conector posterior: entrada CVBS + audio
- **Modo PC**
  - Entrada VGA + audio
- **Modo HD**
  - Entrada HDMI + audio
  - Entrada YPbPr (2fh) + audio (adaptador)

Paneles

- Control superior: usado 2K3
- Conector lateral LCD: usado 2K3
- Conector lateral PDP: nuevo (sin salida de auriculares!)
- Panel led/interruptor: usado 2K3

  interruptor on/off (no interruptor tàctil)

  receptor IR = 3.3V en lugar de 5V
- Alimentación
  - LCD: usado 2K4 (Europa: 230 Vac)
  - PDP : integrado en el display
- Alimentación Standby LCD + audio: 2K4
- Amplificador audio Class D PDP: 2K4
- SSB

PHILIPS

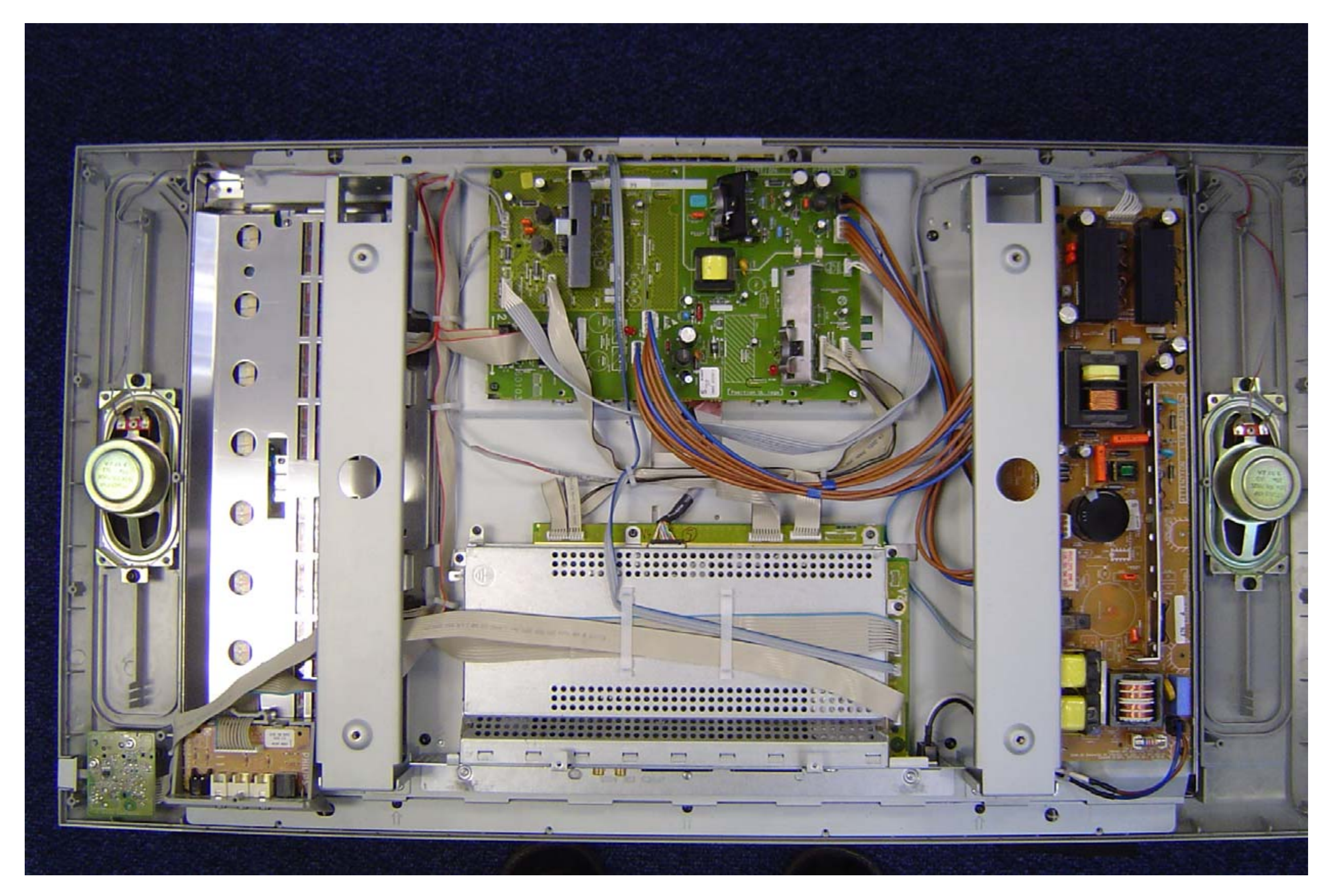
Curso LC04
09B. SSB LC4.6

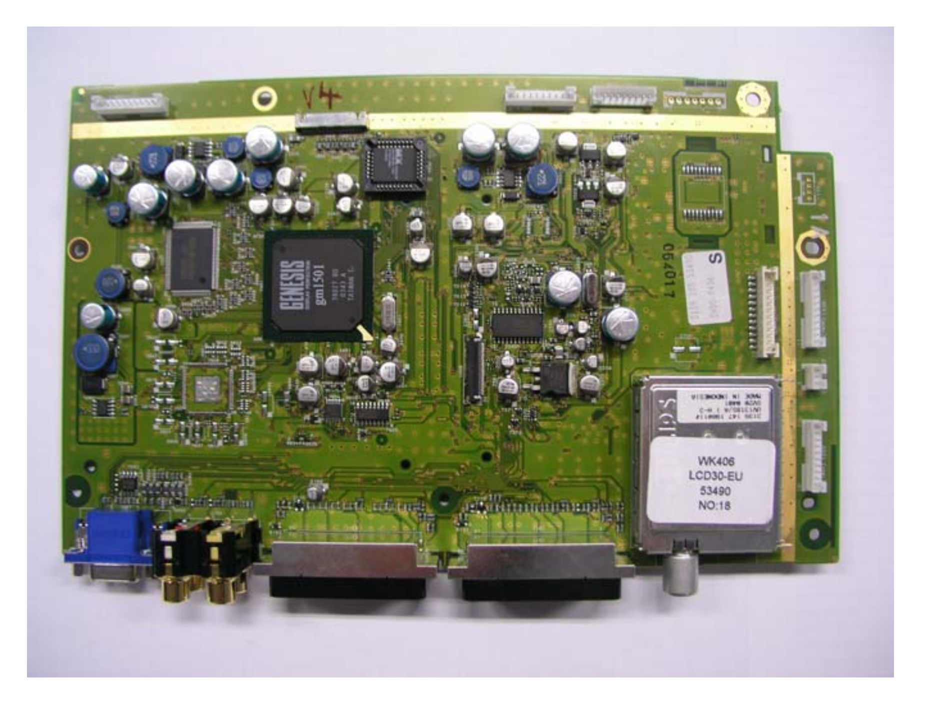
Philips Ibérica – Electrónica de Consumo
Departamento Técnico
Cristina Senallé - Gabriel Arianes
Noviembre 2004

Presentación

- Aparatos:
  - 30" LCD
  - 37" PDP
  - 42" PDP
- SSB de bajo coste:
  - 2 integrados: Hércules & Génesis
  - Mínimas E/S's: euroconector, HDMI, VGA …
  - 4 diversidades (LCD Eur, LCD NAFTA/AP, PDP Eur, PDP Nafta/AP)
  - Alimentaciones de proyectos EMG Top o SDI de 2K4
  - E/S laterales de proyectos EMG Top 2K3
  - Panel Led&Interruptor de proyectos EMG Top de 2K3
  - Amplificador de audio de proyectos EMG Top de 2K4

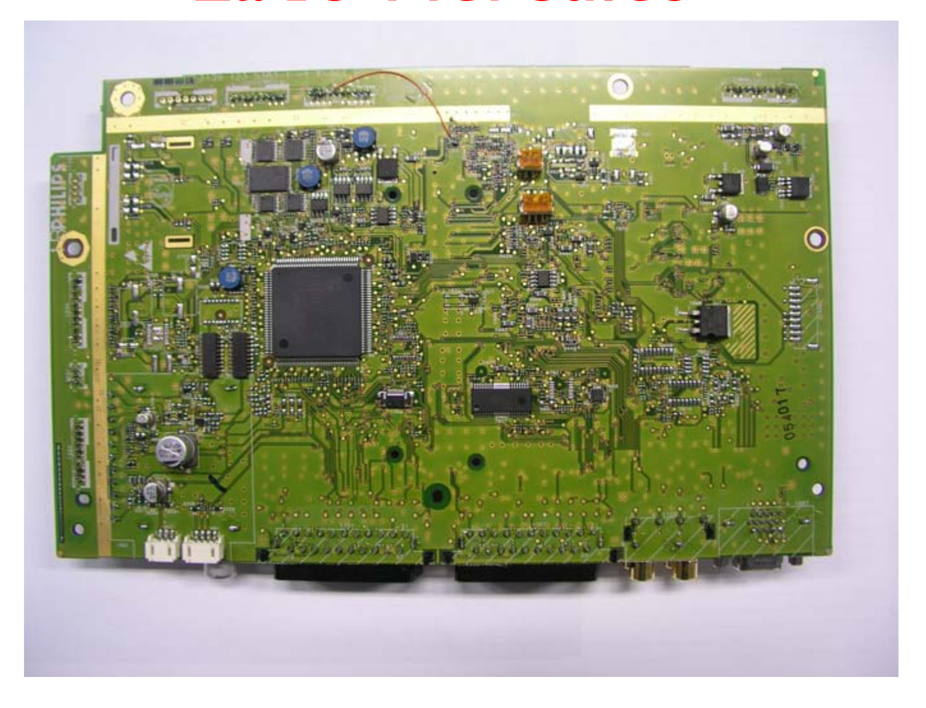
Foto del chasis



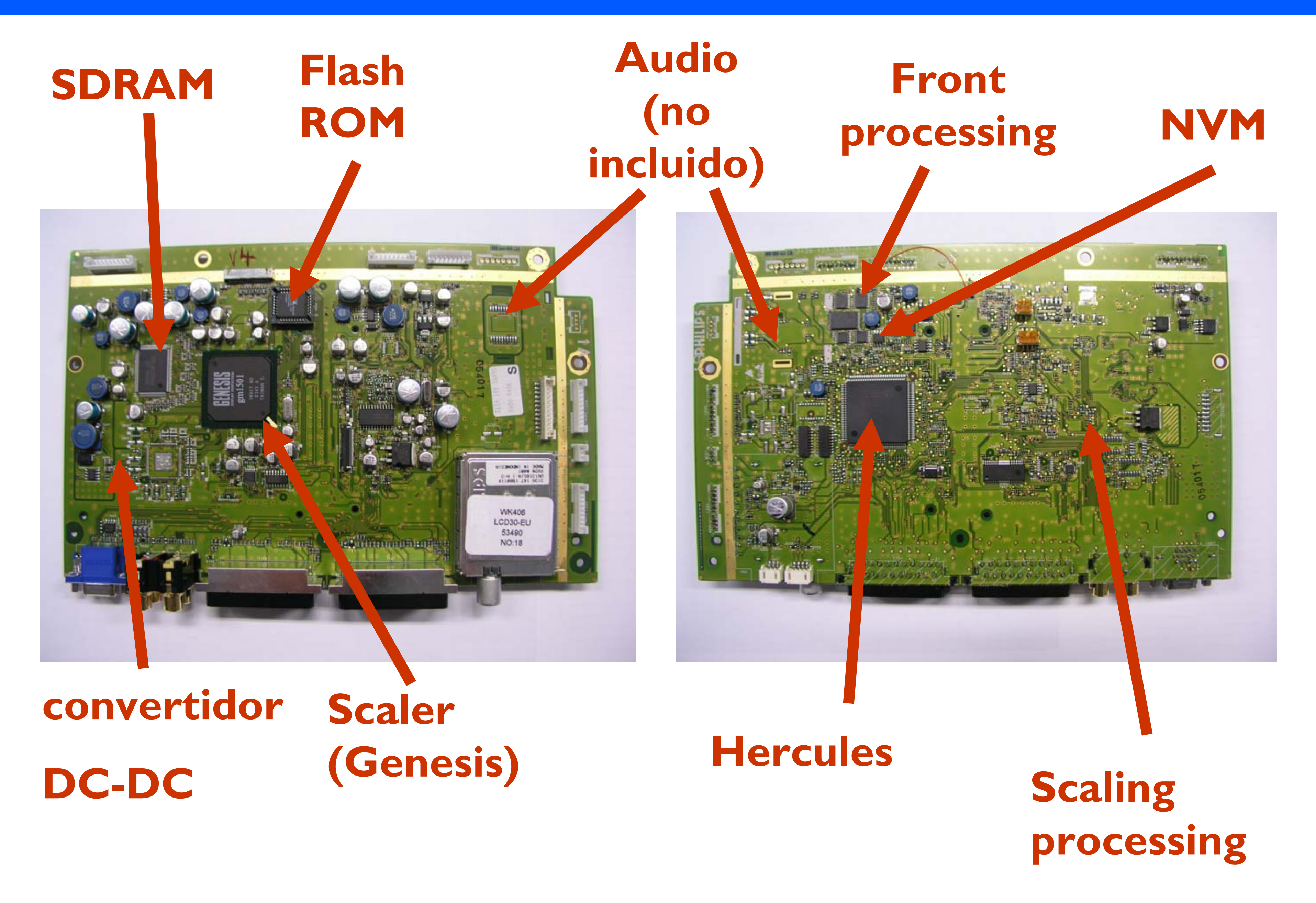


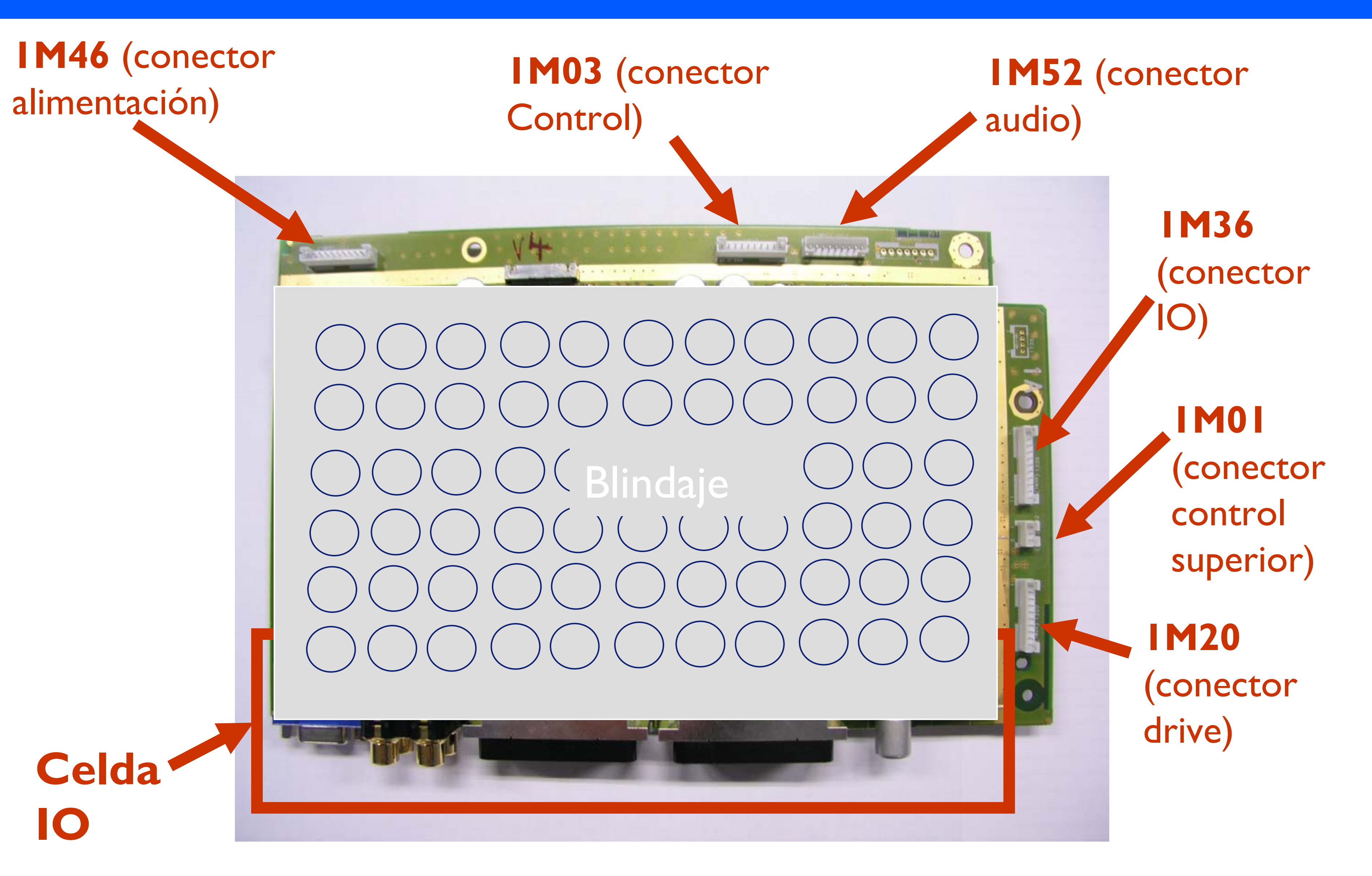
Lado Génesis

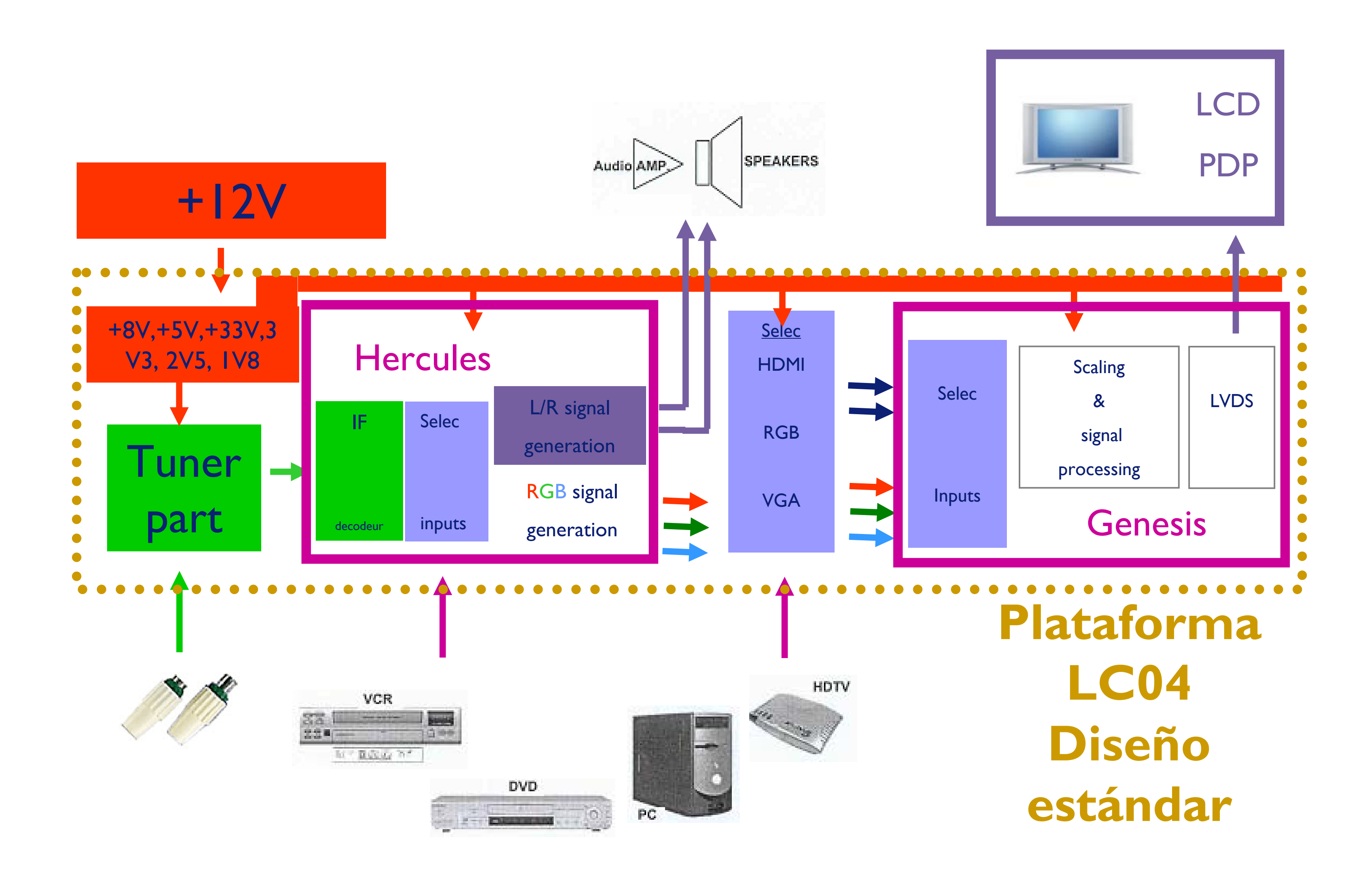
Lado Hércules



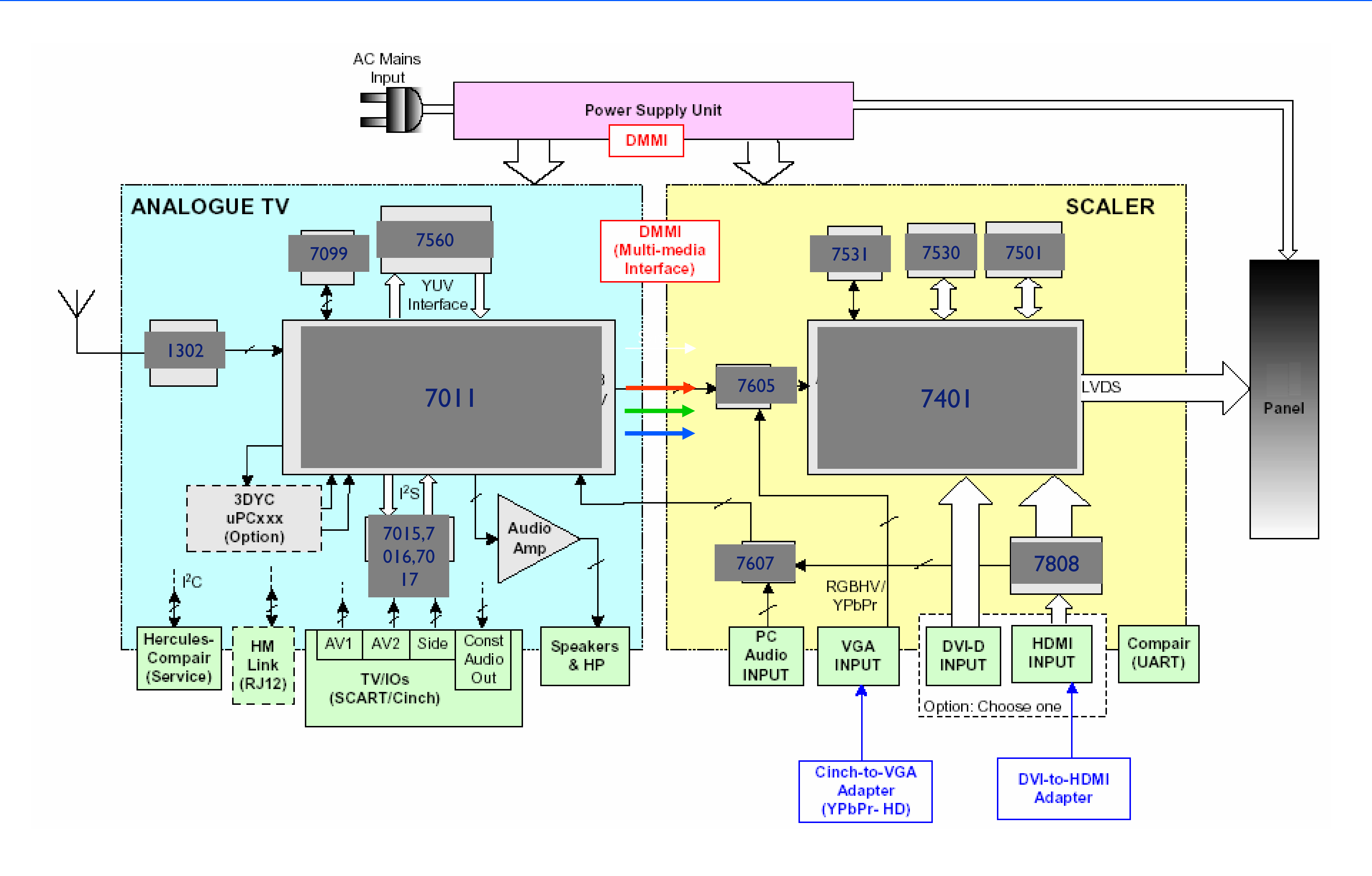
- PCB de 4 capas (1,6 mm x 155 mm x 250 mm)
- Completamente blindada


SDRAM
Flash ROM
Audio (no incluido)
Front processing
NVM
convertidor DC-DC
Scaler (Genesis)
Hercules
Scaling processing


PHILIPS
1M46 (conector alimentación)
1M03 (conector Control)
1M52 (conector audio)
1M36 (conector IO)
1M01 (conector control superior)
1M20 (conector drive)
Blindaje
Celda IO



Plataforma LC04 Diseño estándar

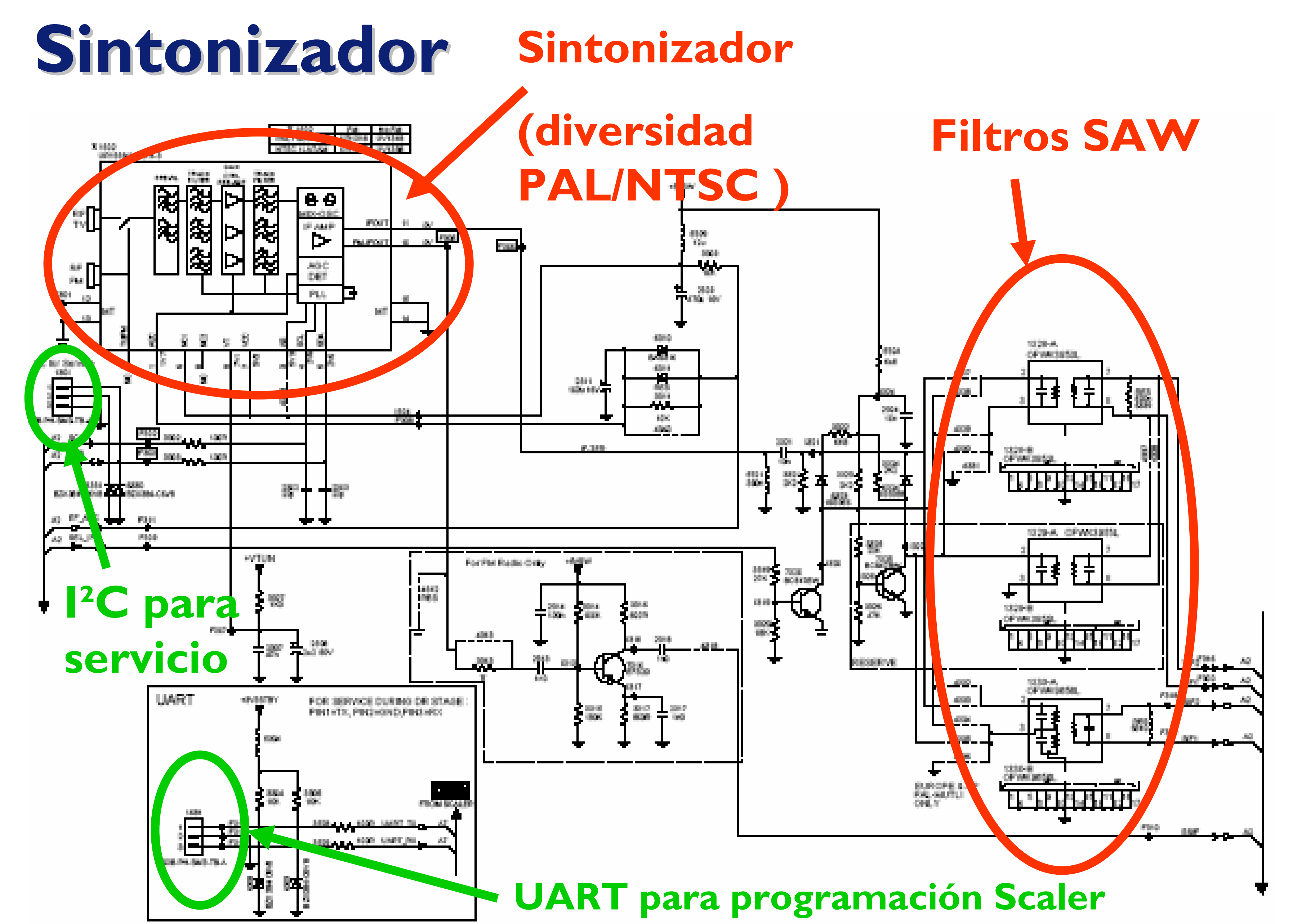


AC Mains Input
Power Supply Unit
DMMI
ANALOGUE TV
SCALER
7099
7560
YUV Interface
DMMI (Multi-media Interface)
7531
7530
7501
1302
7011
7605
7401
LVDS
Panel
3DYC uPCxxx (Option)
I²S
7015,7016,7017
Audio Amp
7607
7808
RGBHV/ YPbPr
I²C
Hercules-Compair (Service)
HM Link (RJ12)
AV1
AV2
Side
Const Audio Out
TV/IOs (SCART/Cinch)
Speakers & HP
PC Audio INPUT
VGA INPUT
DVI-D INPUT
HDMI INPUT
Compair (UART)
Option: Choose one
Cinch-to-VGA Adapter (YPbPr- HD)
DVI-to-HDMI Adapter

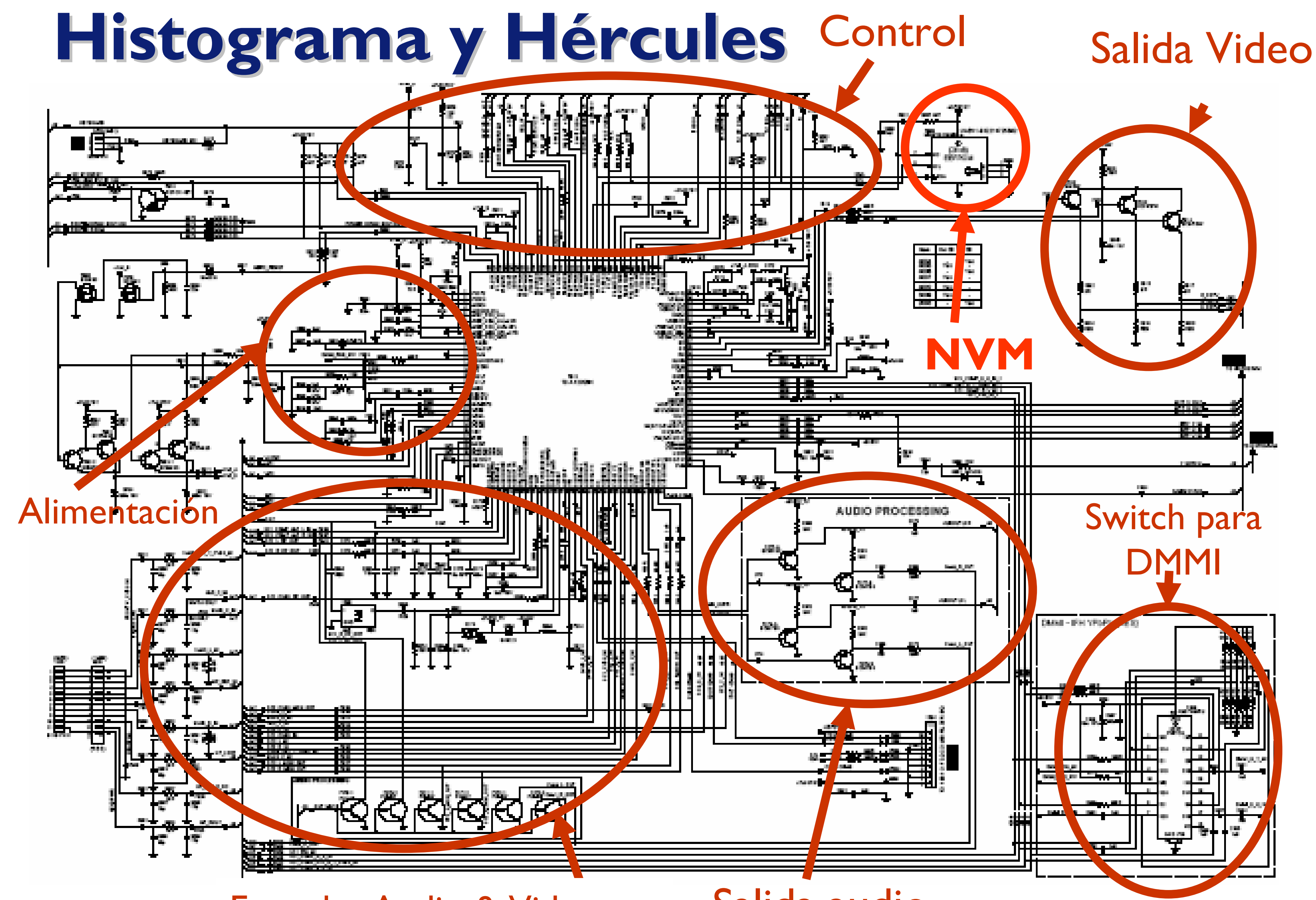
Lista de esquemas

Posnr.	Short Panel description	12NC-naked PCB	12NC Schematic	Page
1101	LC04SD PCB SB TV-SCALER			
	cinch ssb	3139 123 5868*	3139 123 5868*	A17
	scart ssb	3139 123 5838*	3139 123 5838*	A18
				A1
				A2/A3
				A4
				A5
				A6
				A7/A8
				A9
				A10
				A11
				A12
				A13
				A14
				A15
				A16
1114	Top control	3104 303 3691*	8204 000 6604*	P
1116	SIDE IO	3104 303 3649*	8204 000 6393*	O
1006	30" LCD DLIM MAINS FILTER ST/	3104 303 3875*	3104 313 6009*	
			3104 313 6009*	
1005	30" LCD SLIM SUPPLY	3104 303 3876*	3104 313 6010*	
			3104 313 6010*	
1072	LED SWITCH panel	3104 303 3924*	8204 000 6676*	

Sintonizador

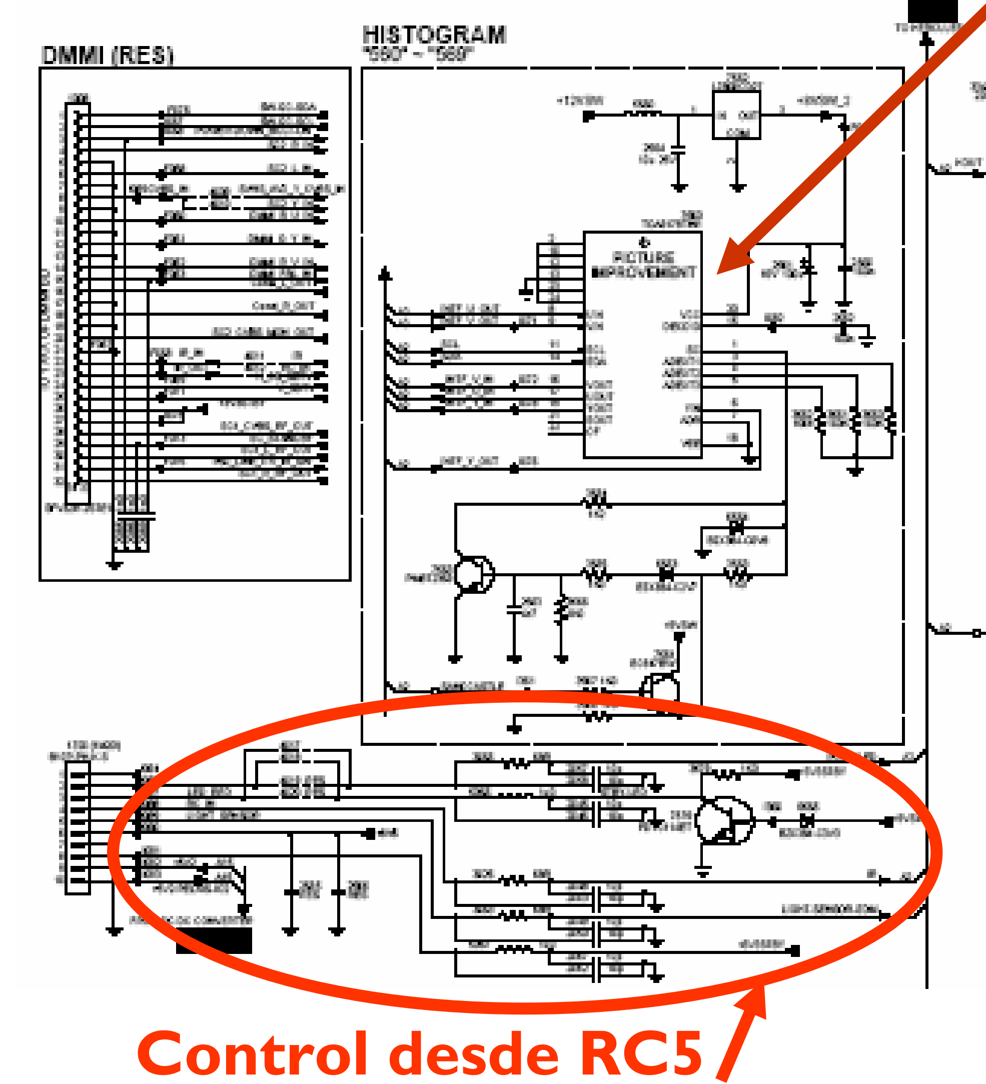


Histograma y Hércules



Procesado de Vídeo

CTI para mejorar la transición de color (aceleración de la croma)

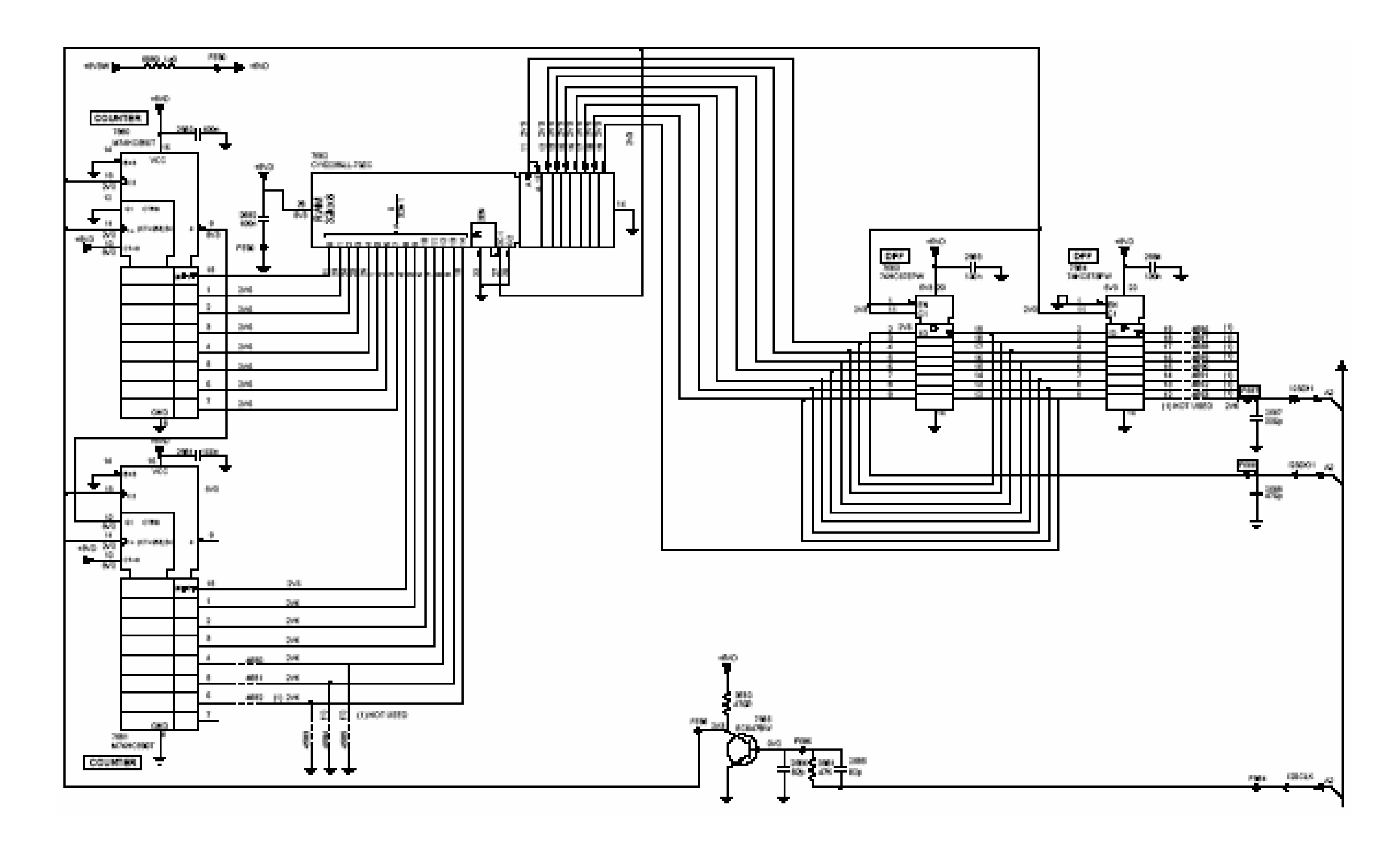


Creación de sincronismo H y V (V generado desde la señal Sandcastle)

Control desde RC5

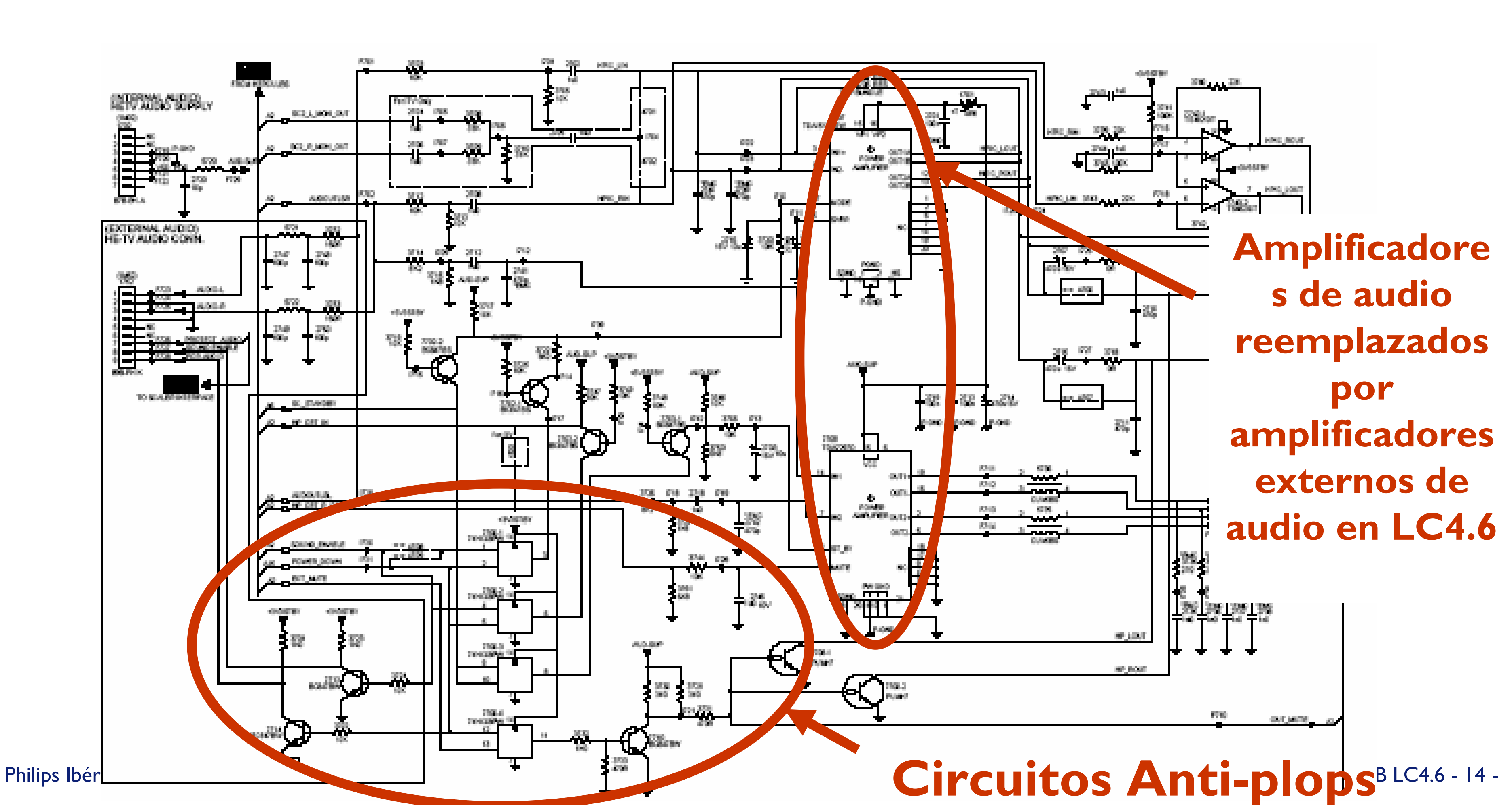
Líneas de retardo de audio

Sólo en aplicaciones PDP



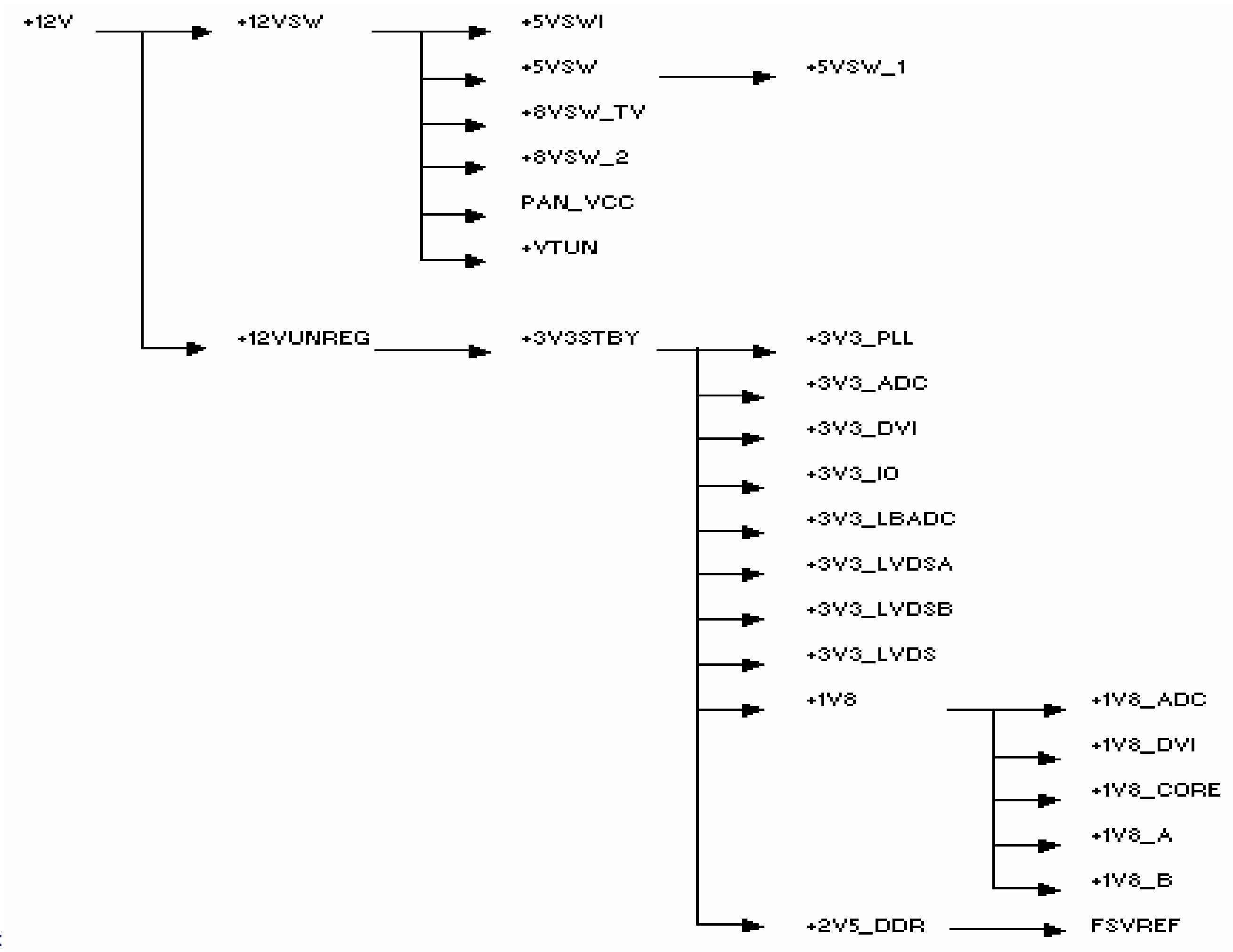
Amplificador de audio

Para reparar ver los esquemas de alimentación de standby de LCD 2K4 / Audio PCB 2K4

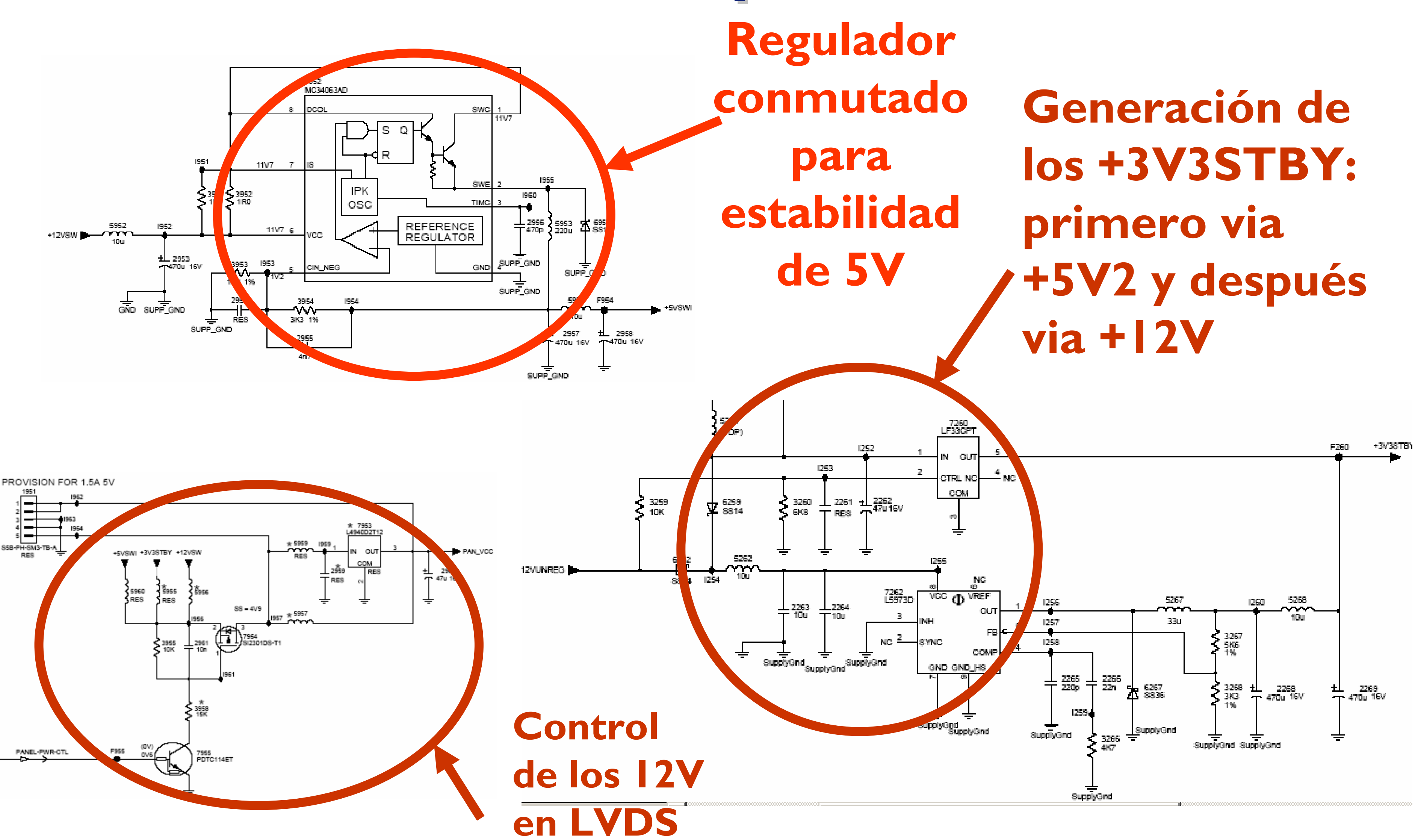


Alimentación de la parte de TV

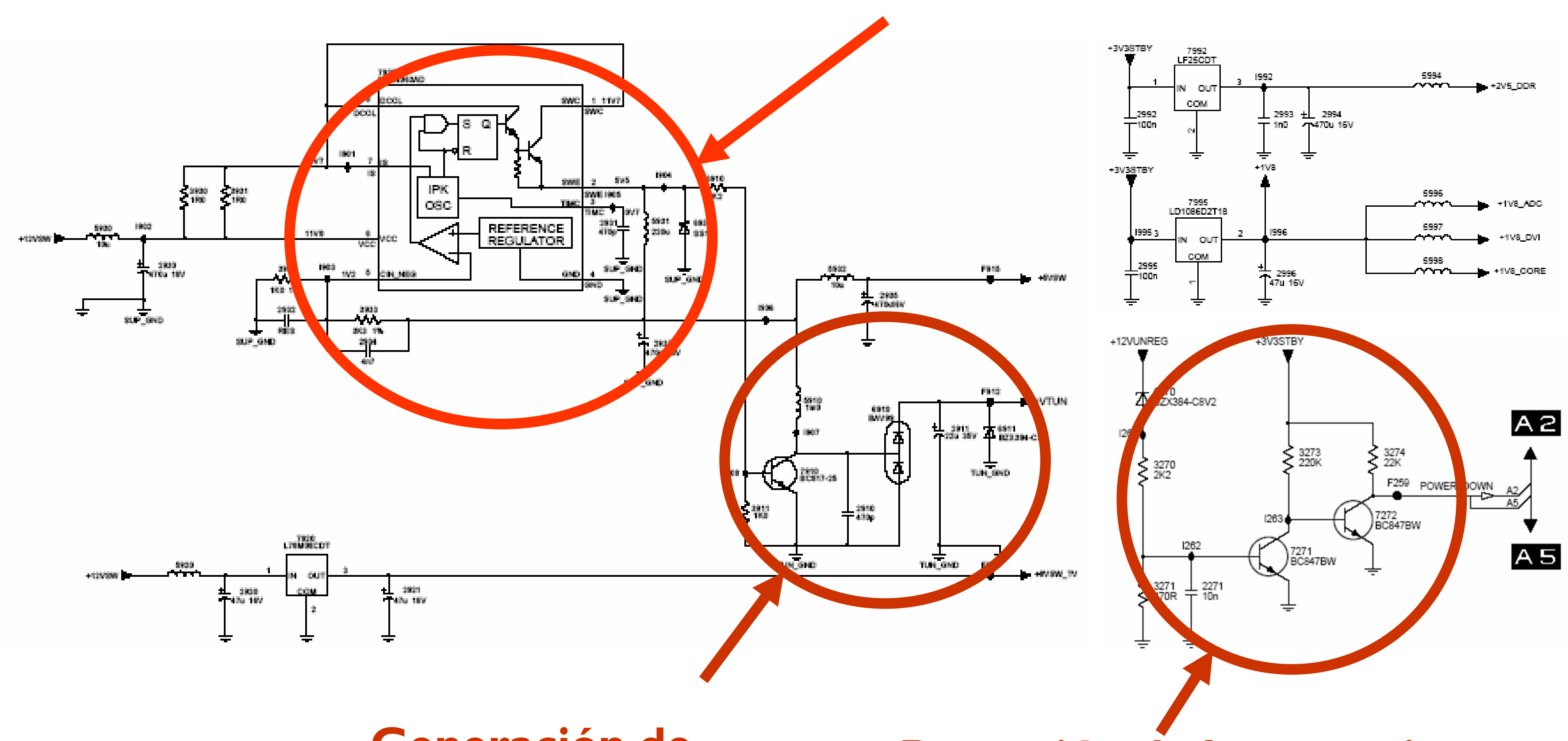
Cada tensión se deriva de 12V (pin 4 de 1M46)



Alimentación de la parte de TV



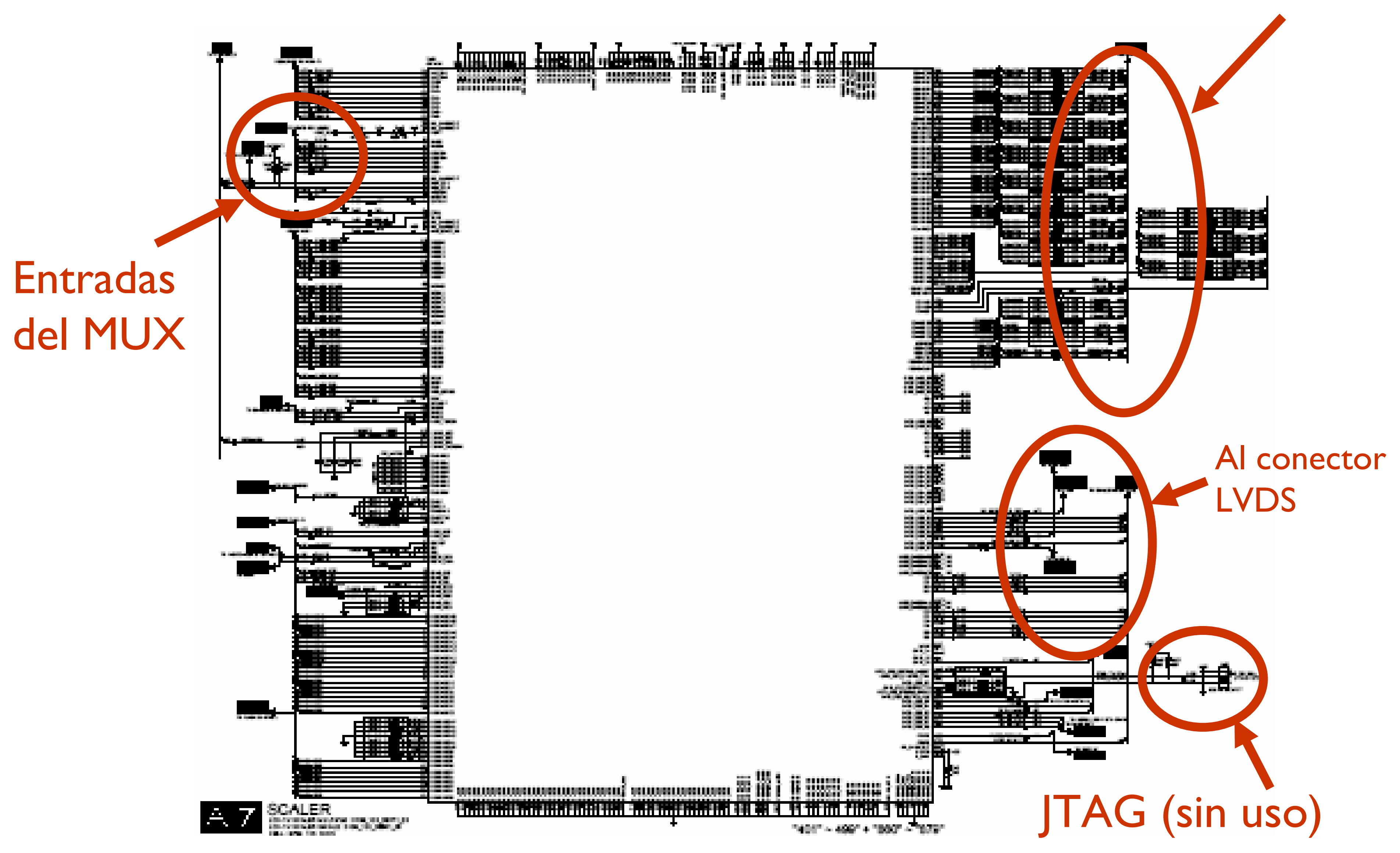
Alimentación de la parte de TV



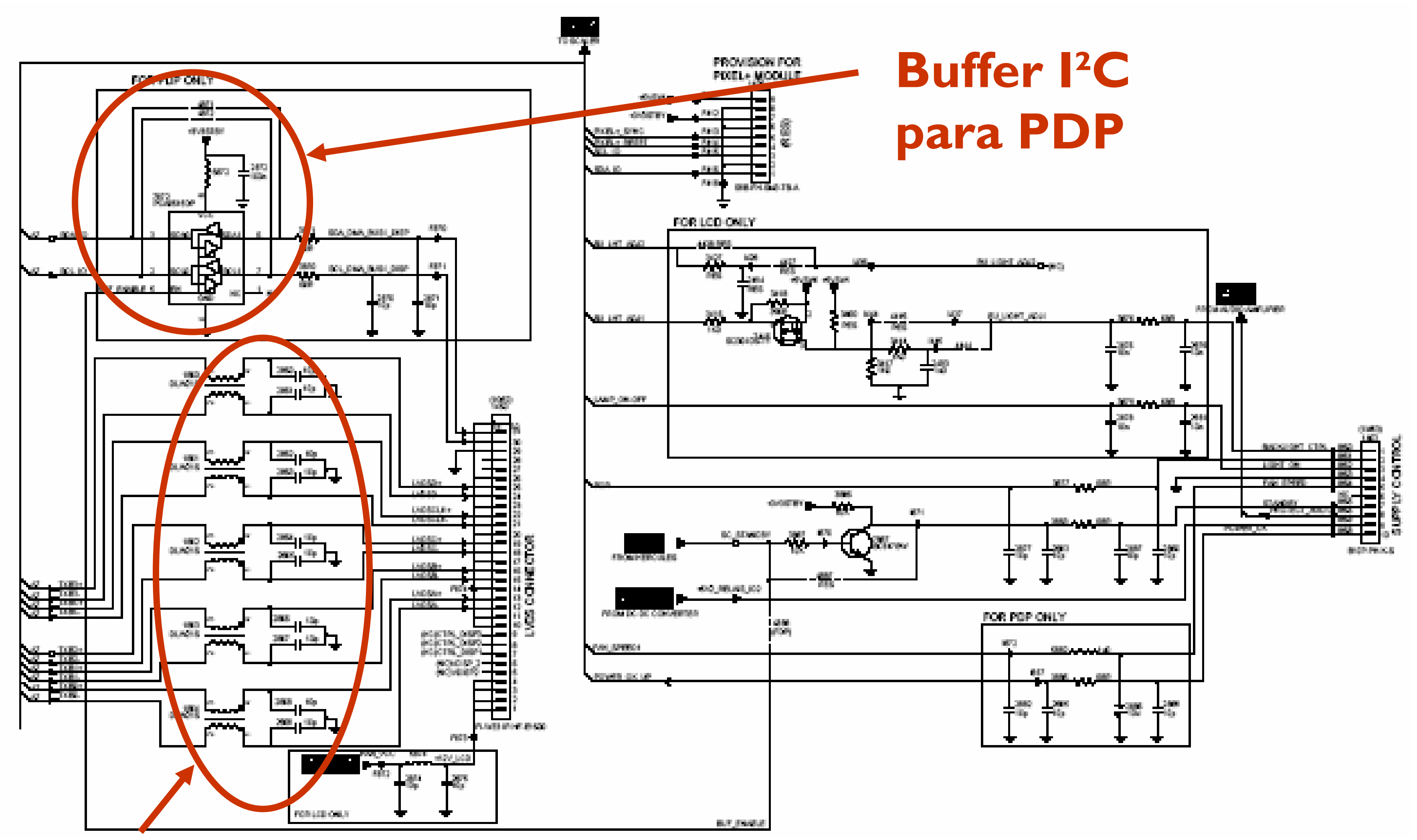
Generación de +33V sintonizador

Detección de la ausencia de 12V para resetear al Hercules

Scaler


A la SDRAM
Entradas del MUX
Al conector LVDS
JTAG (sin uso)
A7
SCALER

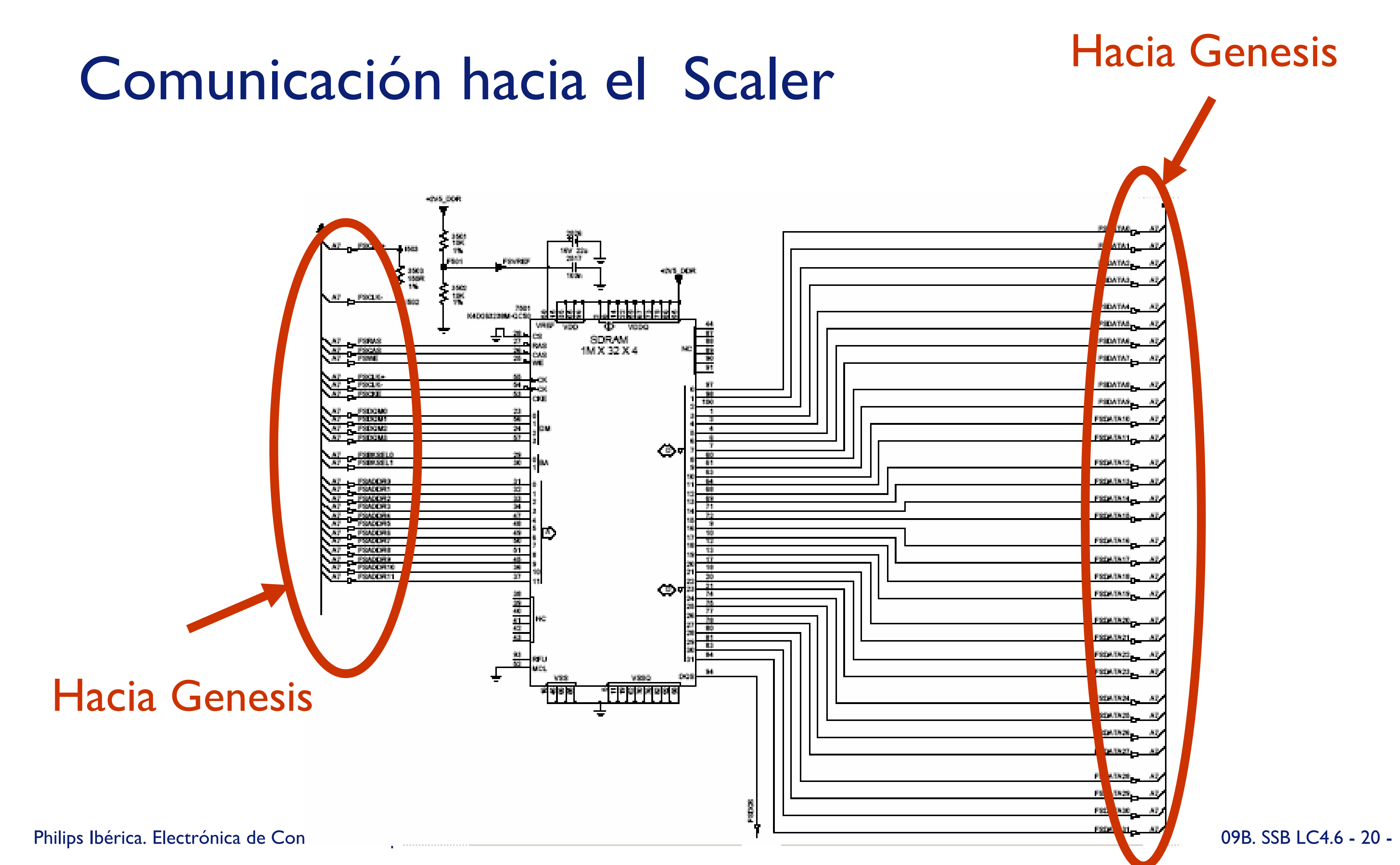
Scaler y sus interfaces



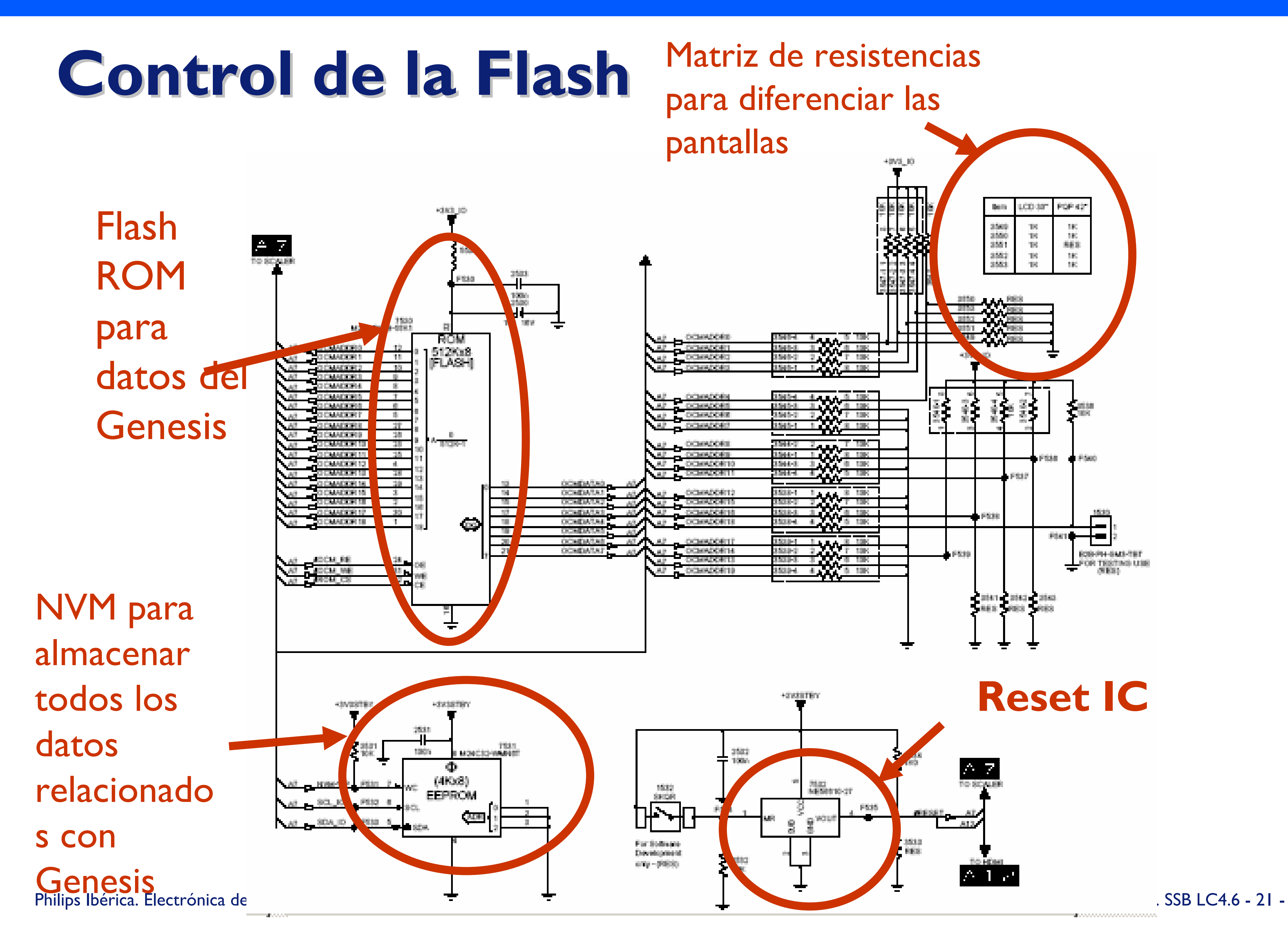
Filtros EMC en LVDS

SDRAM

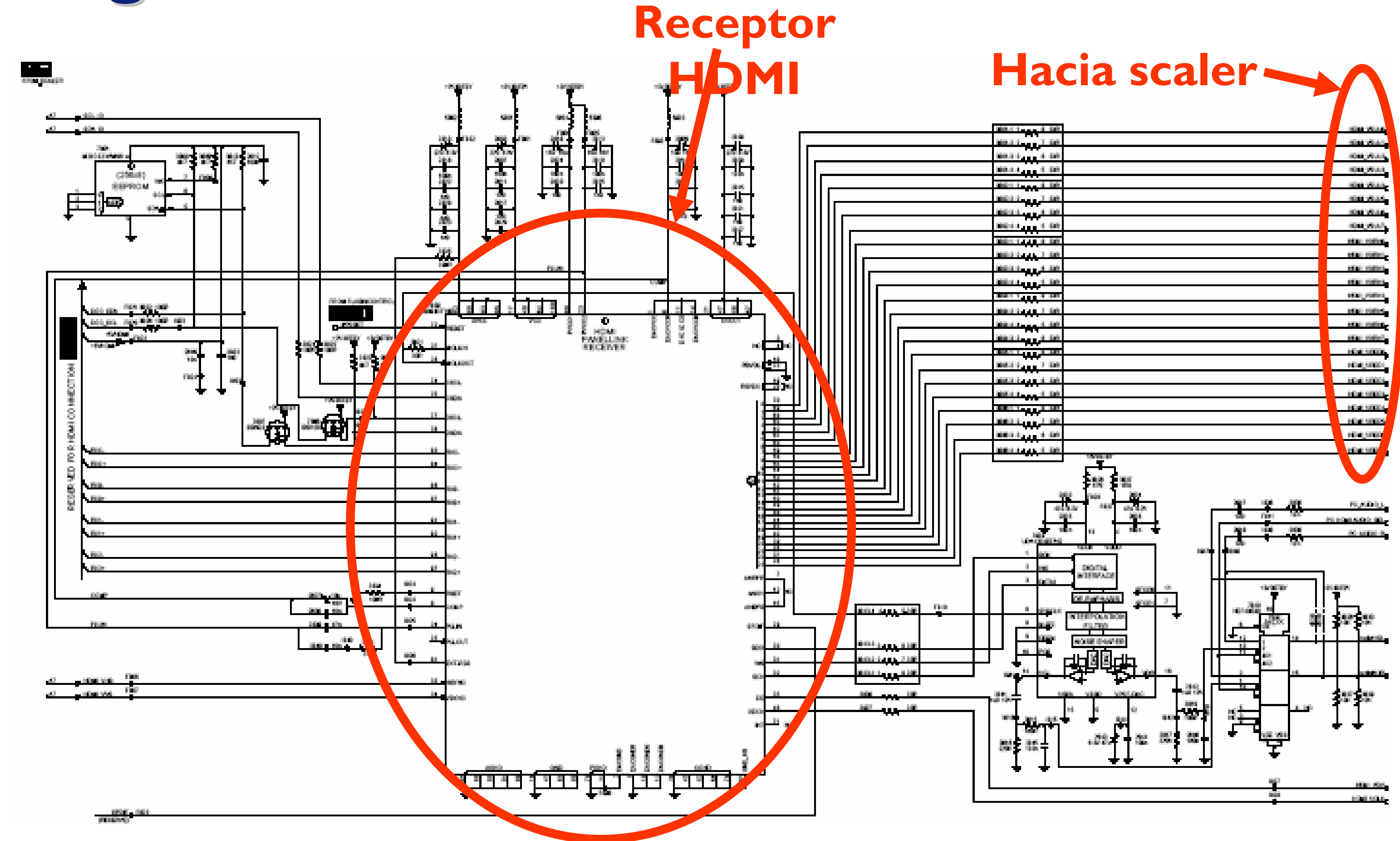
Comunicación hacia el Scaler

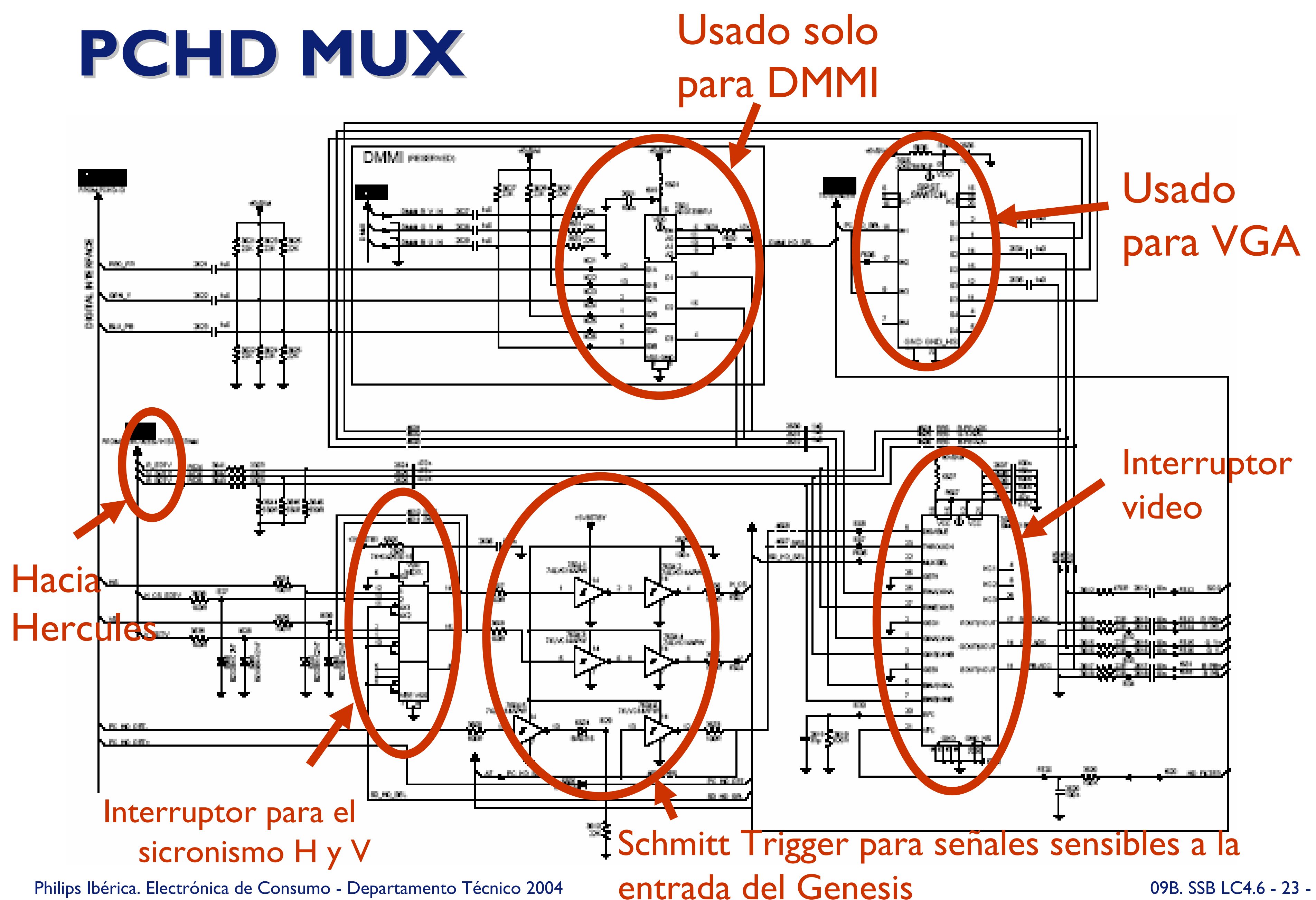


PHILIPS

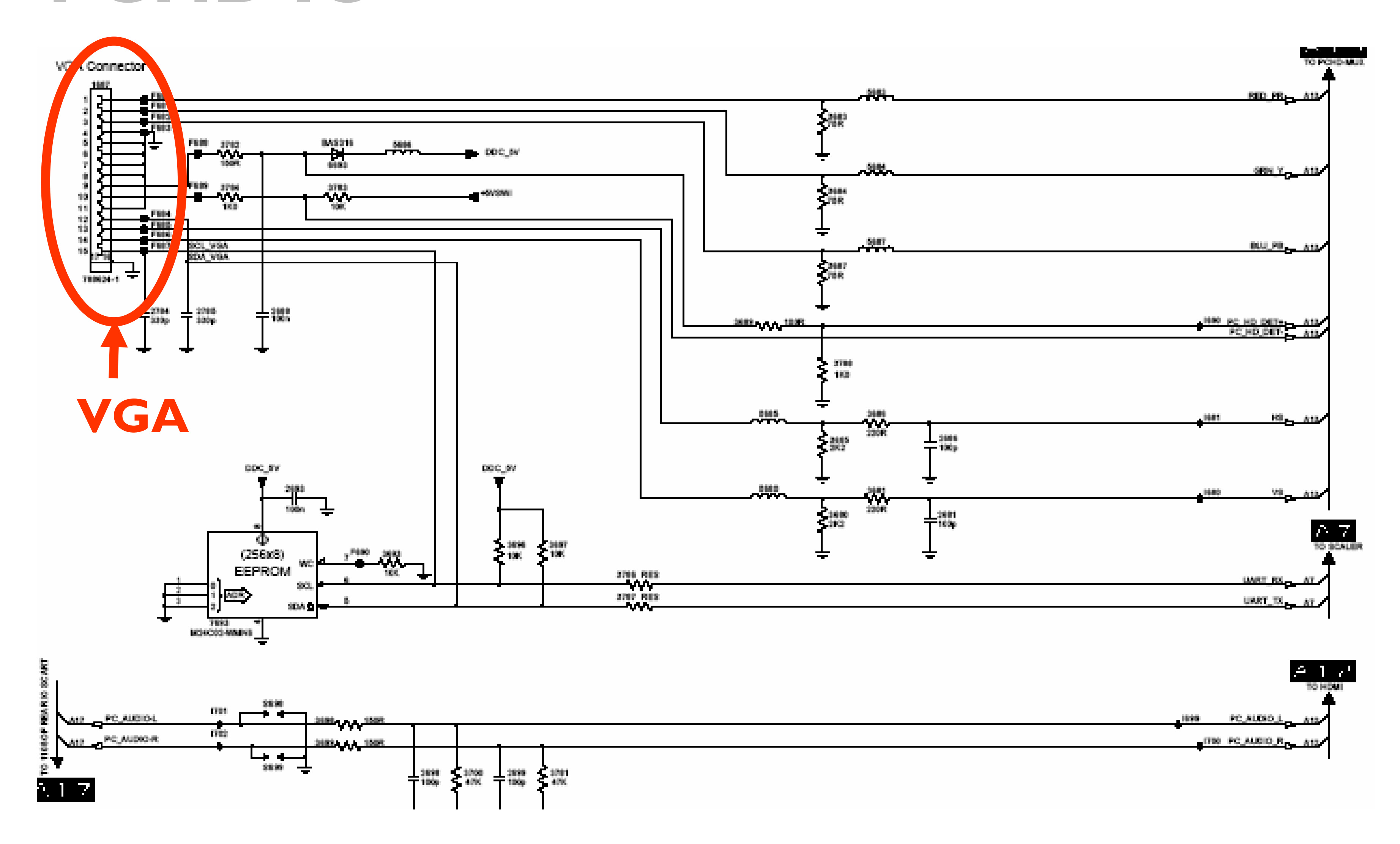

Control de la Flash
Matriz de resistencias para diferenciar las pantallas
Flash ROM para datos del Genesis
NVM para almacenar todos los datos relacionados con Genesis
Reset IC
ROM
512Kx8
[FLASH]
(4Kx8)
EEPROM
Philips Ibérica. Electrónica de
. SSB LC4.6 - 21 -

High Definition Multimedia Interface



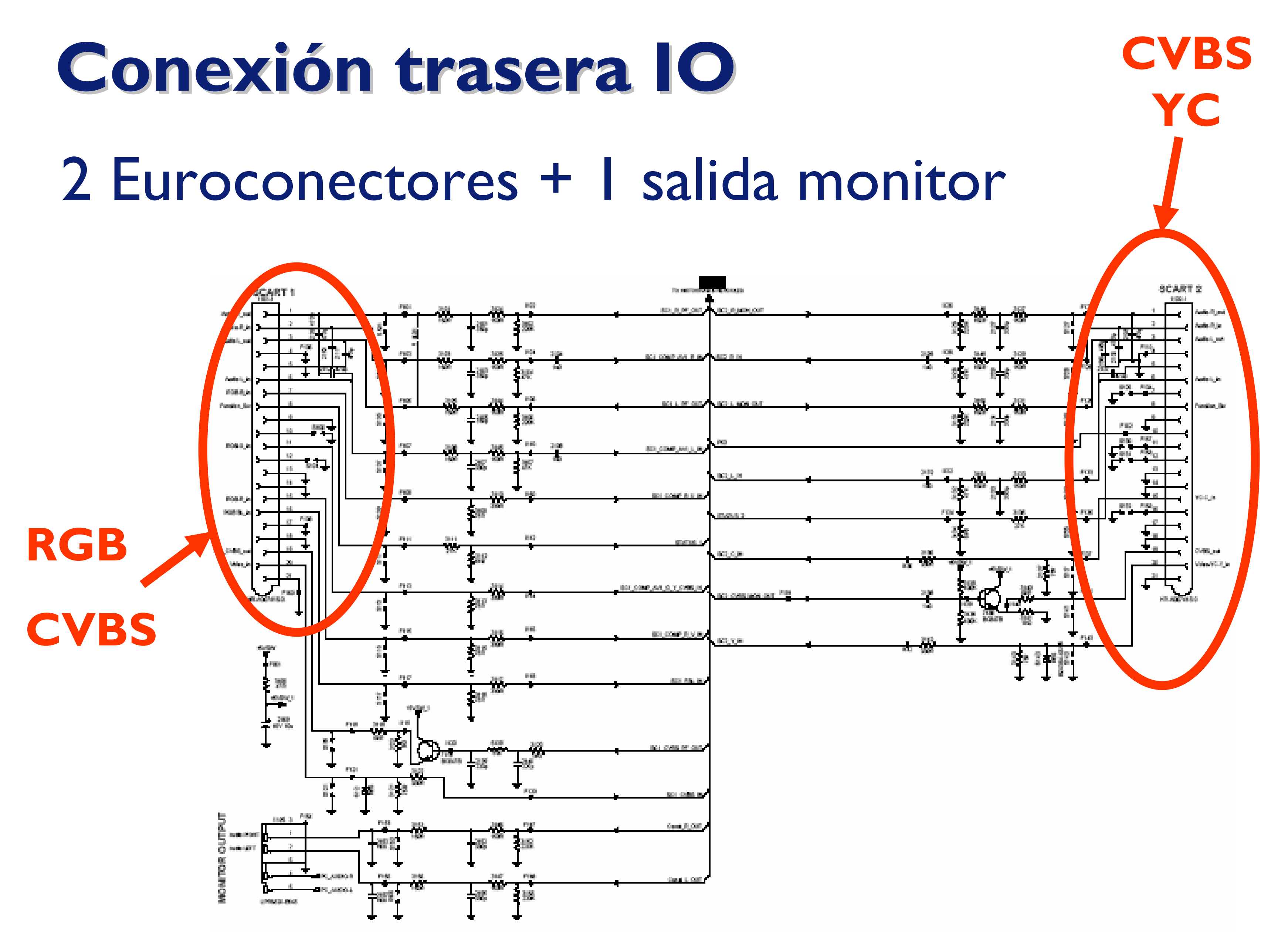

PCHD MUX
Usado solo para DMMI
Usado para VGA
Interruptor video
Hacia Hercules
Interruptor para el sicronismo H y V
Schmitt Trigger para señales sensibles a la entrada del Genesis
DMMI
DIGITAL INTERFACE

PCHD IO


VGA Connector
VGA
DDC_5V
(256x8)
EEPROM
TO PCHD-MUX
TO SCALER
TO HDMI
RED_PR
GRN_Y
BLU_PB
PC_HD_DET+
PC_HD_DET-
HS
VS
UART_RX
UART_TX
PC_AUDIO_L
PC_AUDIO_R
SCL_VGA
SDA_VGA

Conexión trasera IO

2 Euroconectores + 1 salida monitor



PHILIPS

Curso LC04
09C. 30” AUO LC4.6

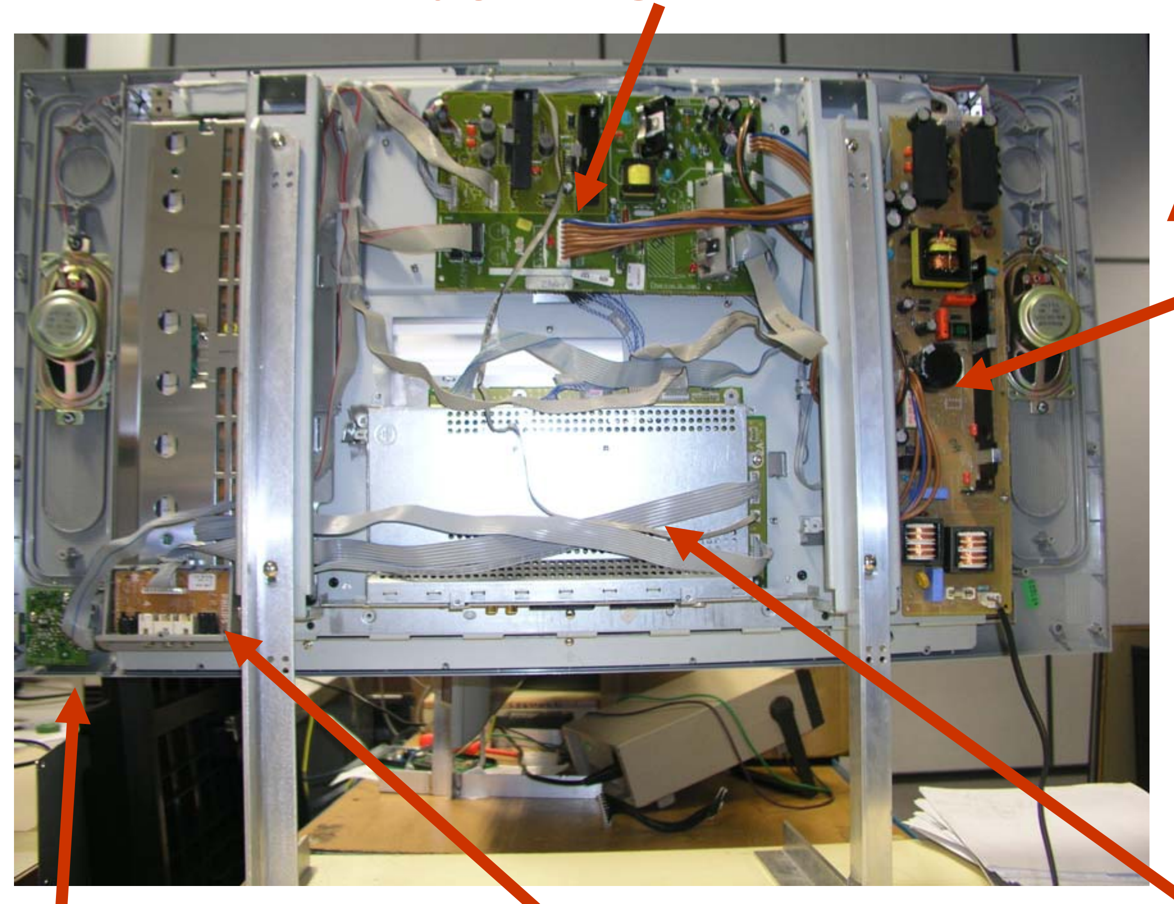
Philips Ibérica – Electrónica de Consumo
Departamento Técnico
Cristina Senallé - Gabriel Arianes
Noviembre 2004

Contenido

- Presentación del aparato de 30”
- Presentación de la SSB del aparato de 30”
- Secuencia de arranque del 30”

Alimentación standby de EMGT 2K4

Alimentación de EMGT 2K4



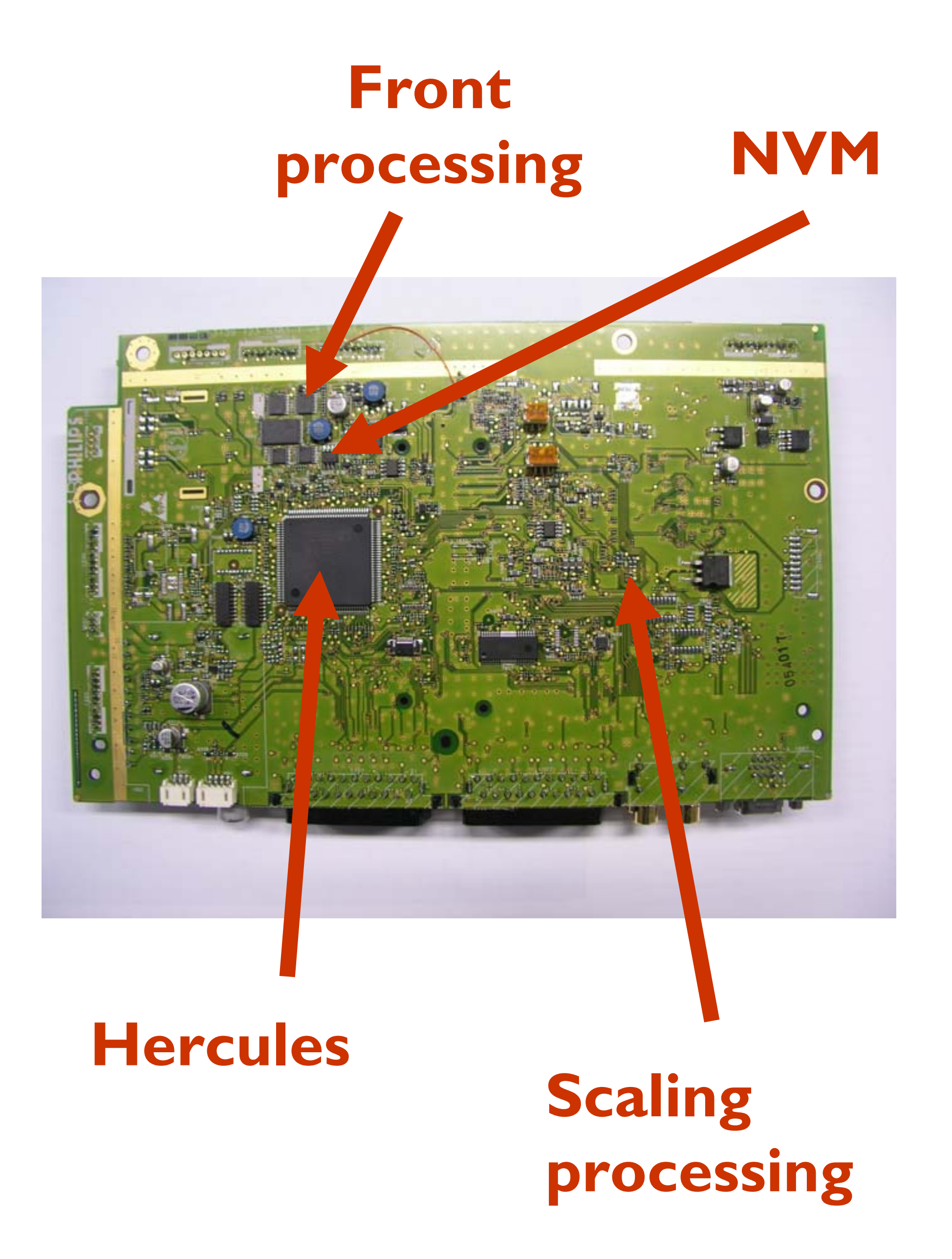
LED&Interruptor de EMGT 2K3

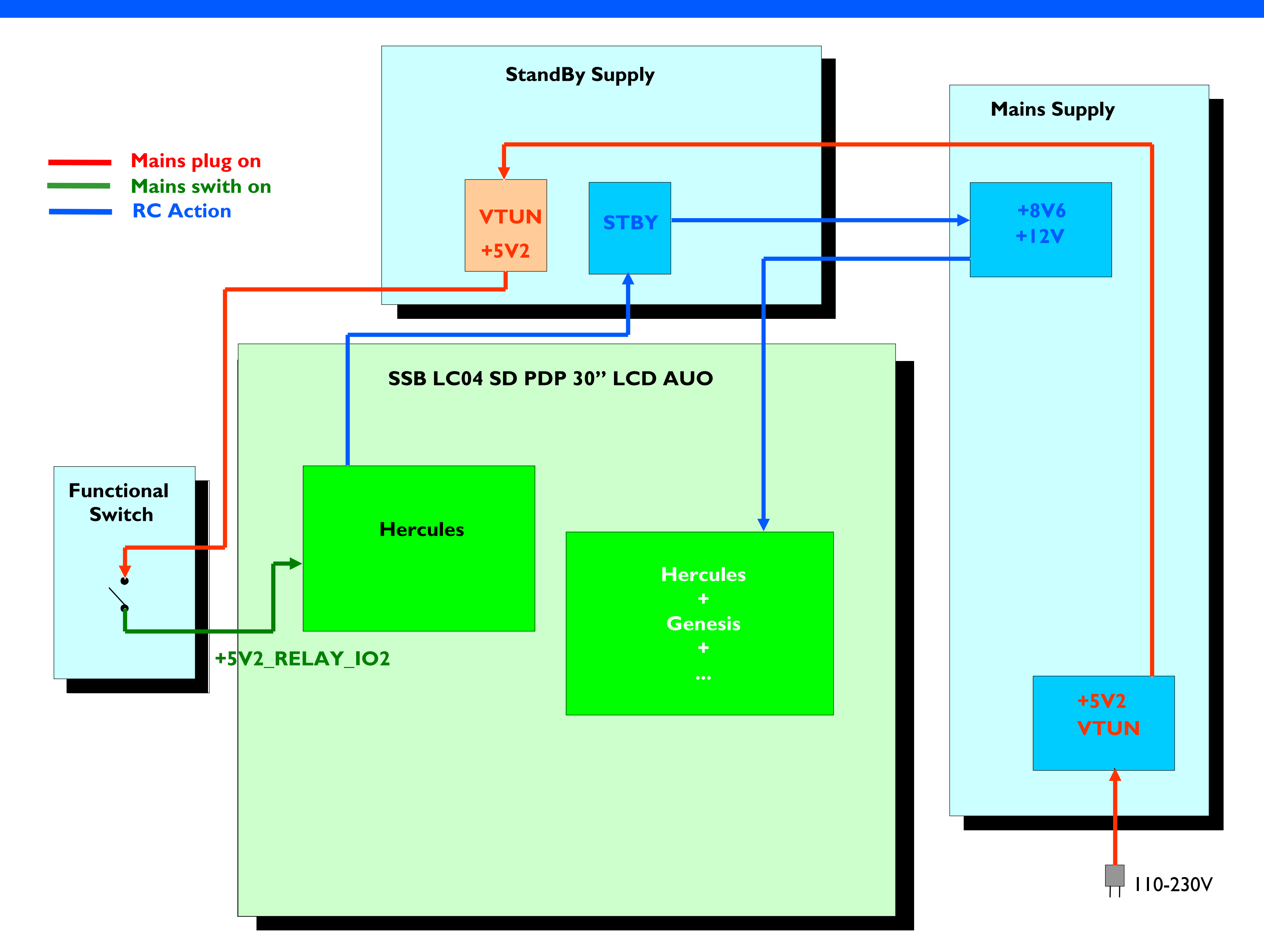
E/S lateral de EMGT 2K3

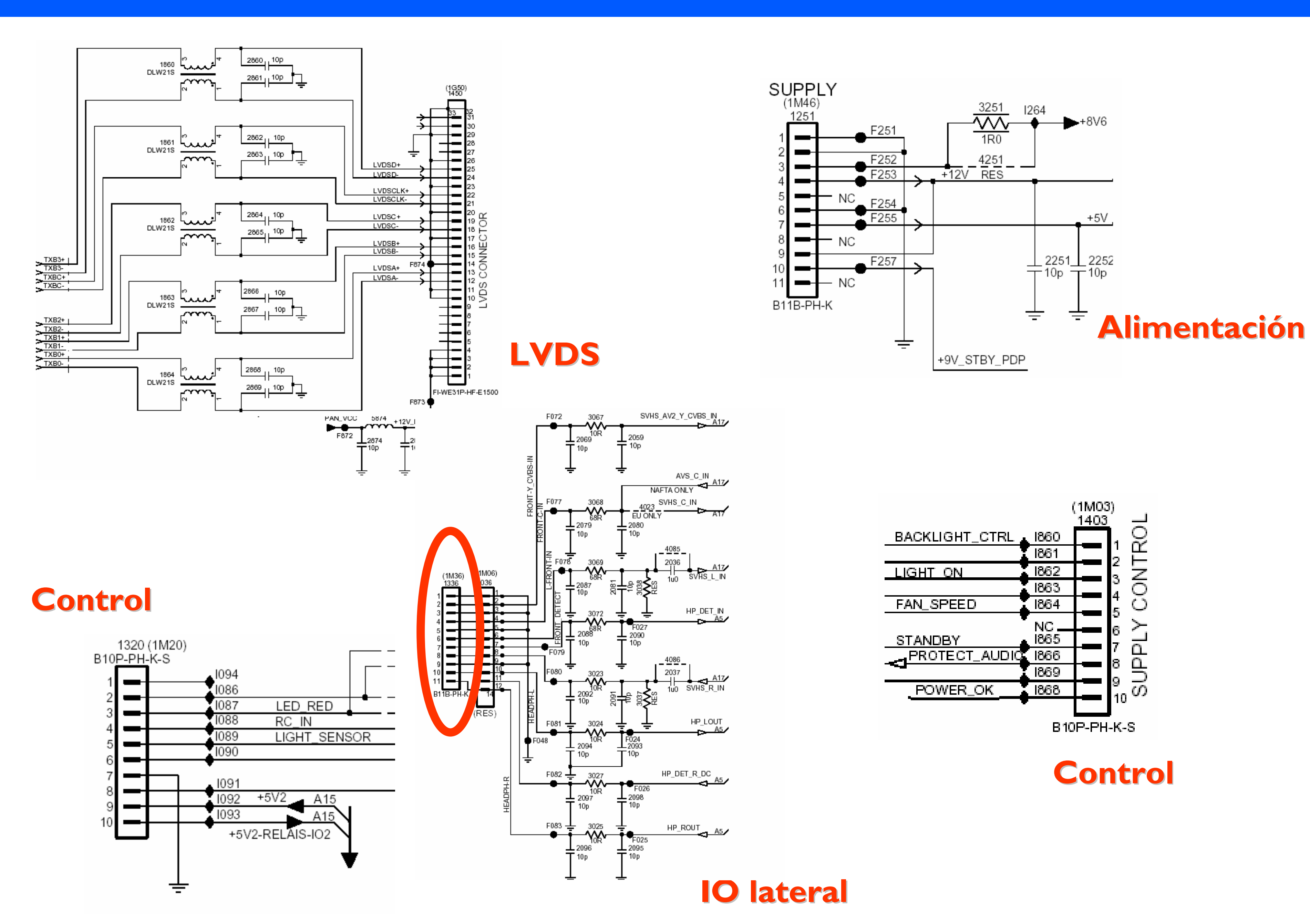
LC4.6 SSB

Flash ROM SW

LVDS




StandBy Supply
Mains Supply
Mains plug on
Mains swith on
RC Action
VTUN
+5V2
STBY
+8V6
+12V
SSB LC04 SD PDP 30” LCD AUO
Functional Switch
Hercules
Hercules
+
Genesis
+
...
+5V2_RELAY_IO2
+5V2
VTUN
110-230V



PHILIPS
LVDS
LVDS CONNECTOR
FI-WE31P-HF-E1500
SUPPLY
(1M46)
1251
B11B-PH-K
+8V6
+12V
RES
+5V
+9V_STBY_PDP
Alimentación
Control
1320 (1M20)
B10P-PH-K-S
LED_RED
RC_IN
LIGHT_SENSOR
+5V2
+5V2-RELAIS-IO2
(1M36)
1336
B11B-PH-K
(RES)
SVHS_AV2_Y_CVBS_IN
AVS_C_IN
NAFTA ONLY
SVHS_C_IN
EU ONLY
SVHS_L_IN
HP_DET_IN
SVHS_R_IN
HP_LOUT
HP_DET_R_DC
HP_ROUT
IO lateral
(1M03)
1403
BACKLIGHT_CTRL
LIGHT_ON
FAN_SPEED
STANDBY
PROTECT_AUDIO
POWER_OK
SUPPLY CONTROL
B10P-PH-K-S
Control

PHILIPS

Curso LC04
09D. 37” y 42” SDI LC4.6

Philips Ibérica – Electrónica de Consumo
Departamento Técnico
Cristina Senallé - Gabriel Arianes
Noviembre 2004

Contenido

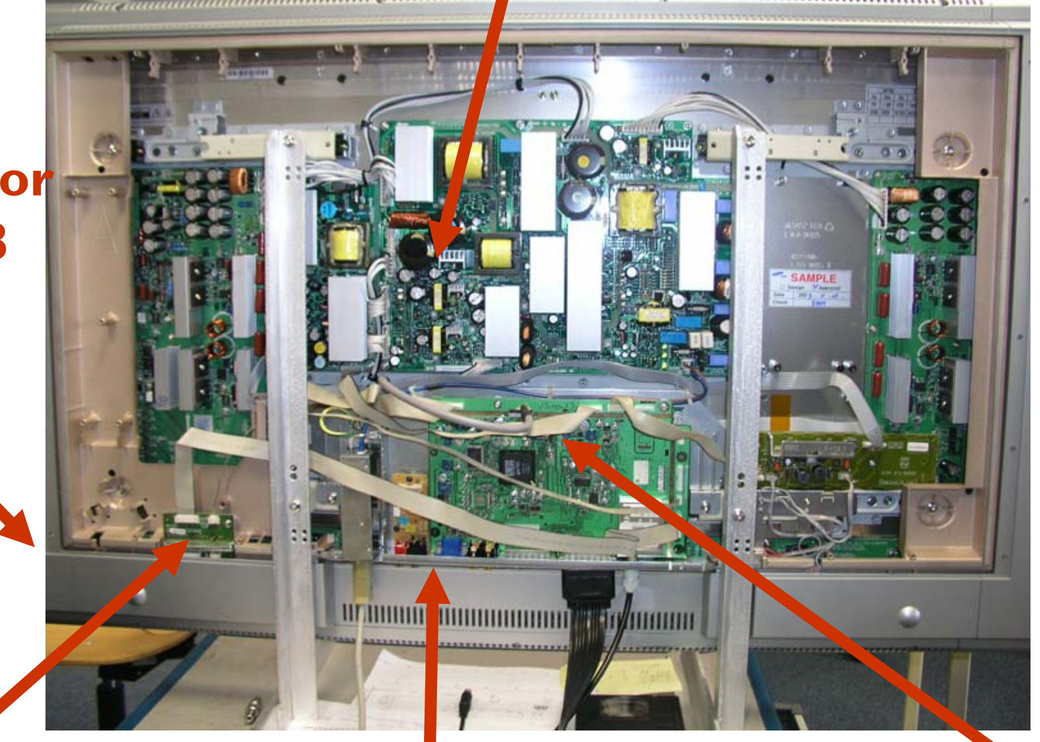
- Presentación del aparato de 42”
- Presentación de la SSB de los aparatos 37”/42”
- Secuencia de arranque de los PDP

Alimentación de SDI PDP



LED&Interruptor

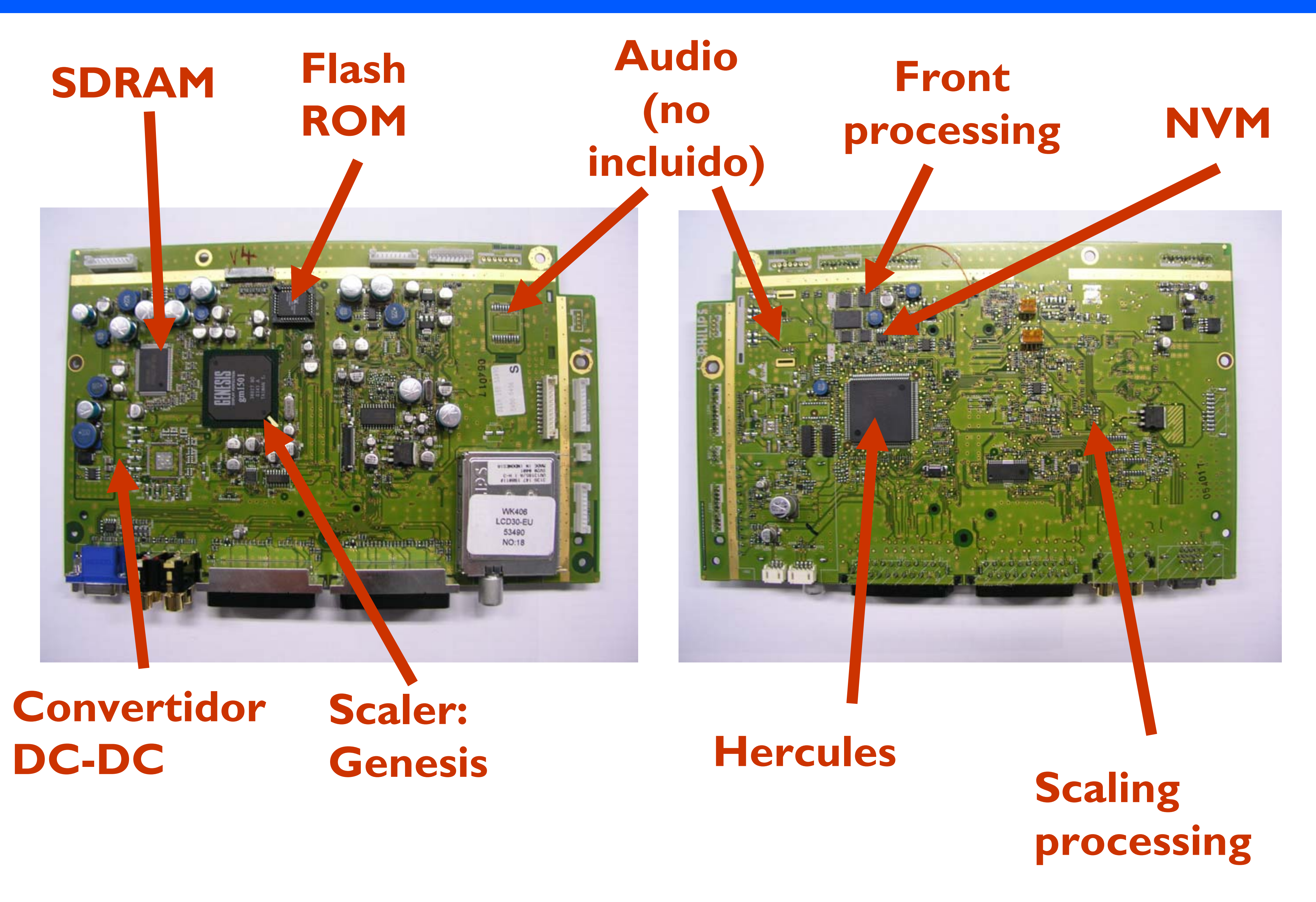




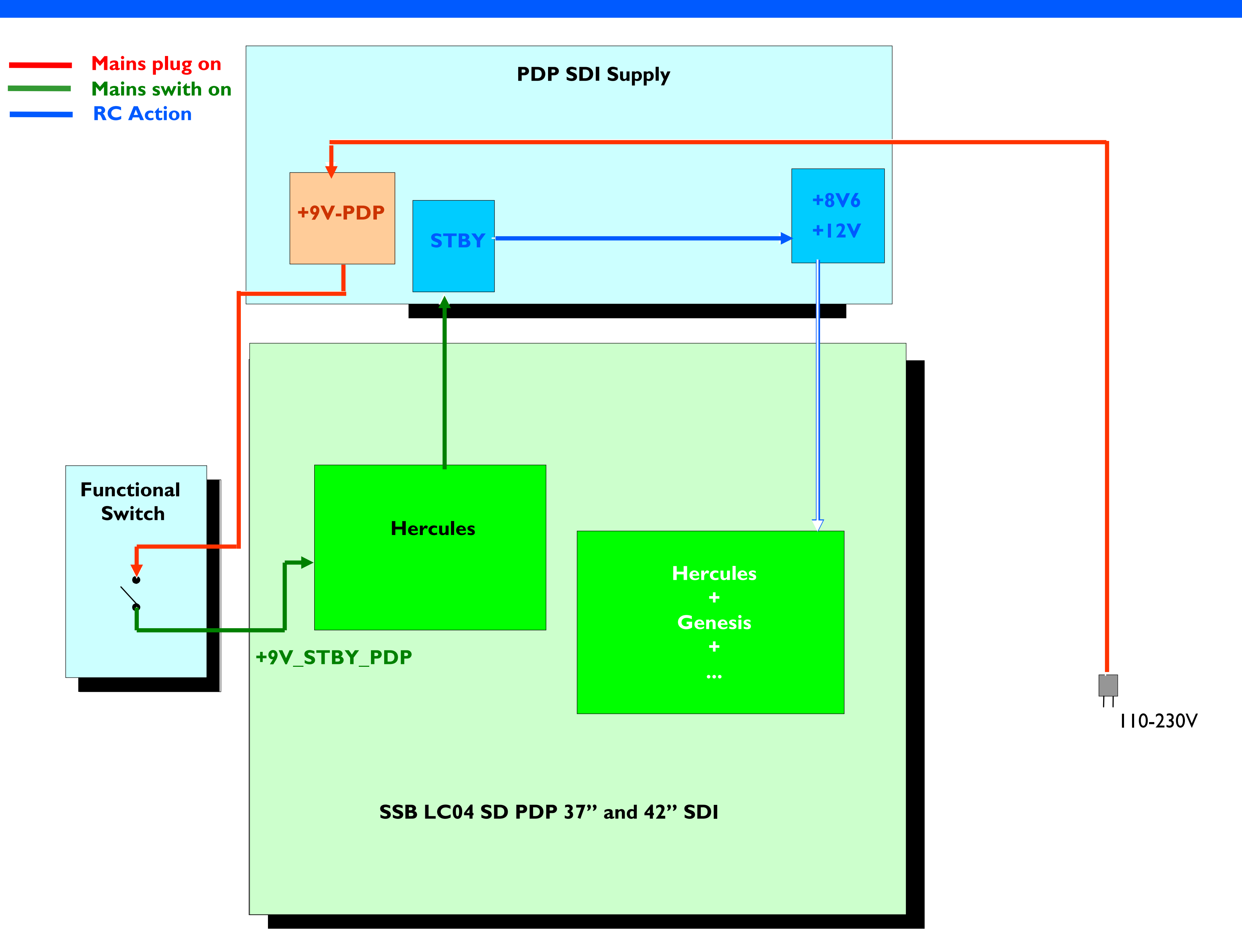
Interface de Eidhoven

IO lateral de EMGT 2K3

LC4.7 SSB

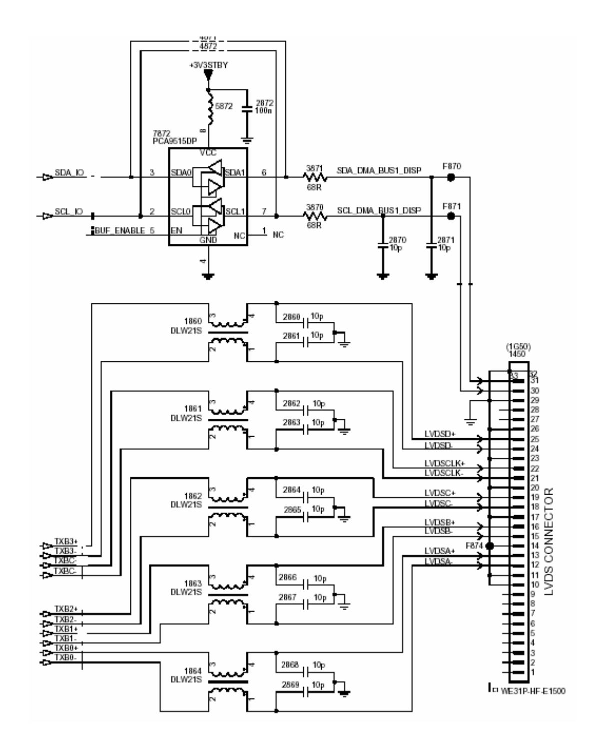

SDRAM
Flash ROM
Audio (no incluido)
Front processing
NVM
Convertidor DC-DC
Scaler: Genesis
Hercules
Scaling processing
GENESIS
gm1501
WK406
LCD30-EU
53490
NO:18

PHILIPS

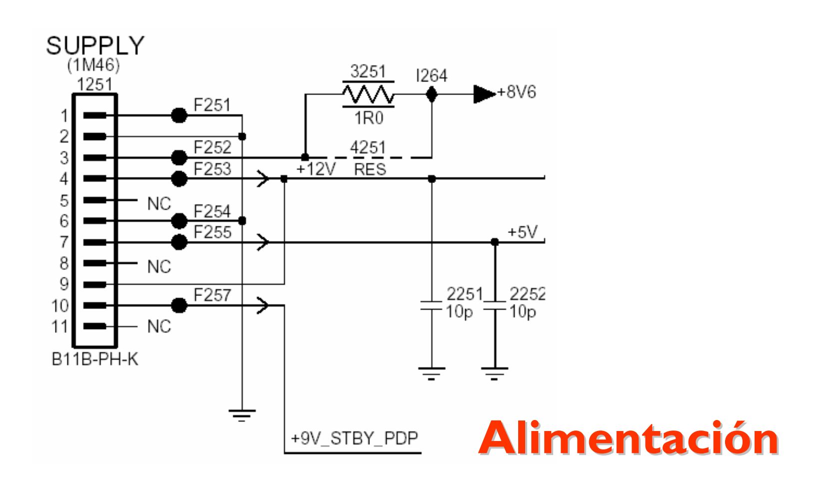


Mains plug on
Mains swith on
RC Action
PDP SDI Supply
+9V-PDP
STBY
+8V6
+12V
Functional Switch
Hercules
Hercules
+
Genesis
+
...
+9V_STBY_PDP
SSB LC04 SD PDP 37” and 42” SDI
110-230V

PHILIPS

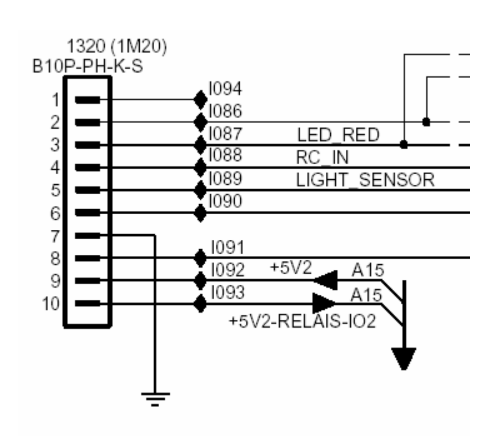


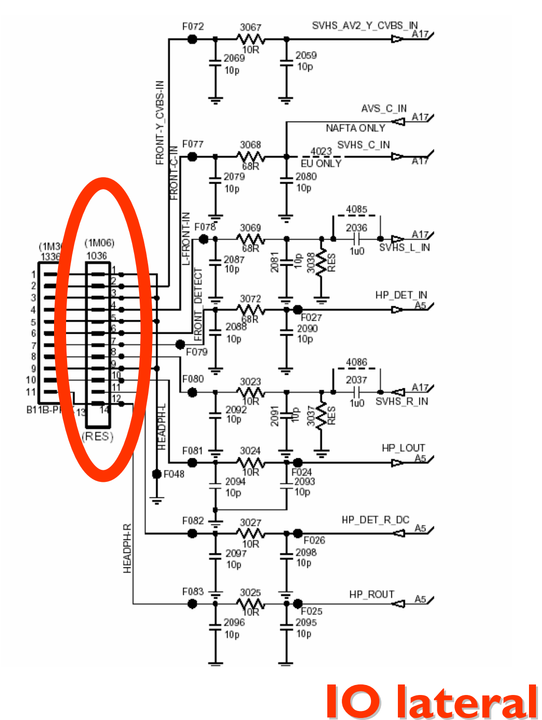
LVDS



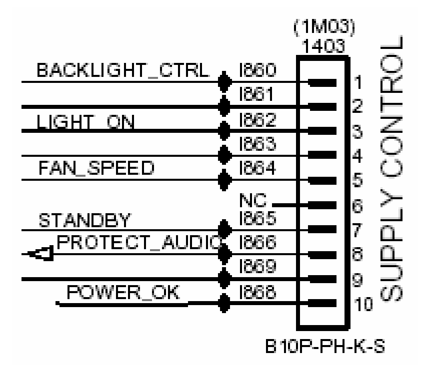
Alimentación

Control





IO lateral



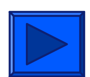
Control

PHILIPS

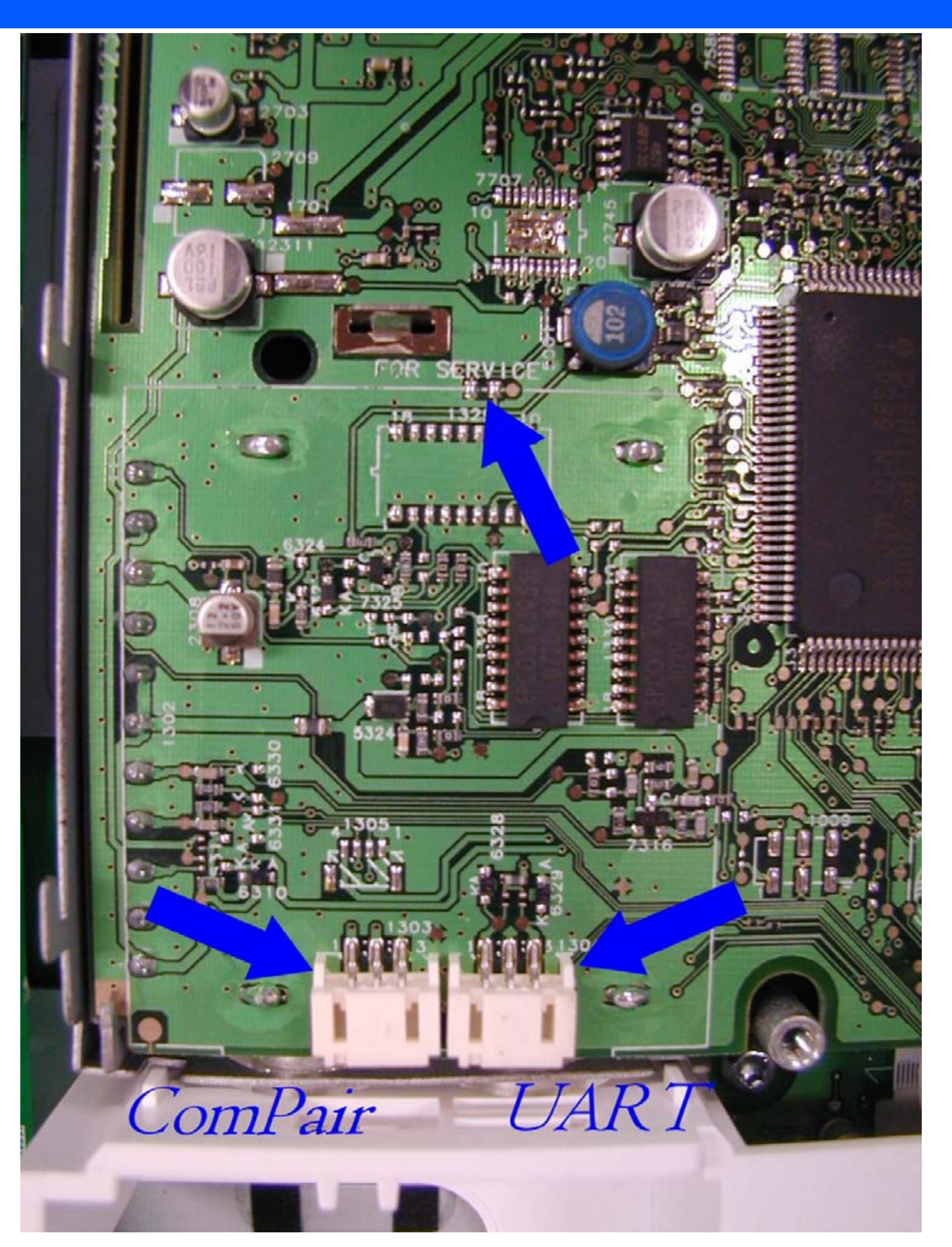
Curso LC04
10. Servicio

Philips Ibérica – Electrónica de Consumo
Departamento Técnico
Cristina Senallé - Gabriel Arianes
Noviembre 2004

Modos de servicio

- **SDM**
  - Entrada:
    - cortocircuitar pines (ver siguiente transparencia)
    - 062596<menu>
  - Información: versión SW 
  - Salida: Standby
- **SAM**
  - Entrada:
    - Align,
    - 062596<info+>
  - Información: ajustes, editor NVM (no cambiar los datos!)
  - Salida: Standby
- **CSM**
  - Entrada: 123654
  - Información: versión SW, opciones, errores, ….
  - Salida: presionar cualquier tecla en el mando a distancia

Pines de Servicio



Modos de servicio

- **Ajuste de la escala de grises**
  - Sólo disponible en tres fuentes:
    - TV
    - PC-A
    - HD-A (AP & NAFTA)
  - Procedimiento:
    - Conmutar al modo seleccionado (TV/PC/HD)
    - Presionar "mute"
    - Realizar los ajustes según modo:
      - TV: Smart Picture a suave
      - PC: brillo y contraste a 50
    - Presionar OSD-Mute-Mute-Mute-OSD-MENU-OSD

Modos de servicio

- **Recarga de la NVM**
  - TV (Hercules) NVM
    - Cortocircutar los pines de servicio, presionar CH+ y encender (necesario cuando se sustituye la NVM por una vacía)
    - Ir al SAM. Ir al editor NVM. Cambiar el valor del dato en la dirección 01 a 170 y guardar. Desconectar y volver a conectar a la corriente y esperar hasta que el LED se ponga rojo.
  - Scaler NVM
    - Una NVM vacía será recargada automáticamente
    - Enviar la orden de recarga desde ComPair

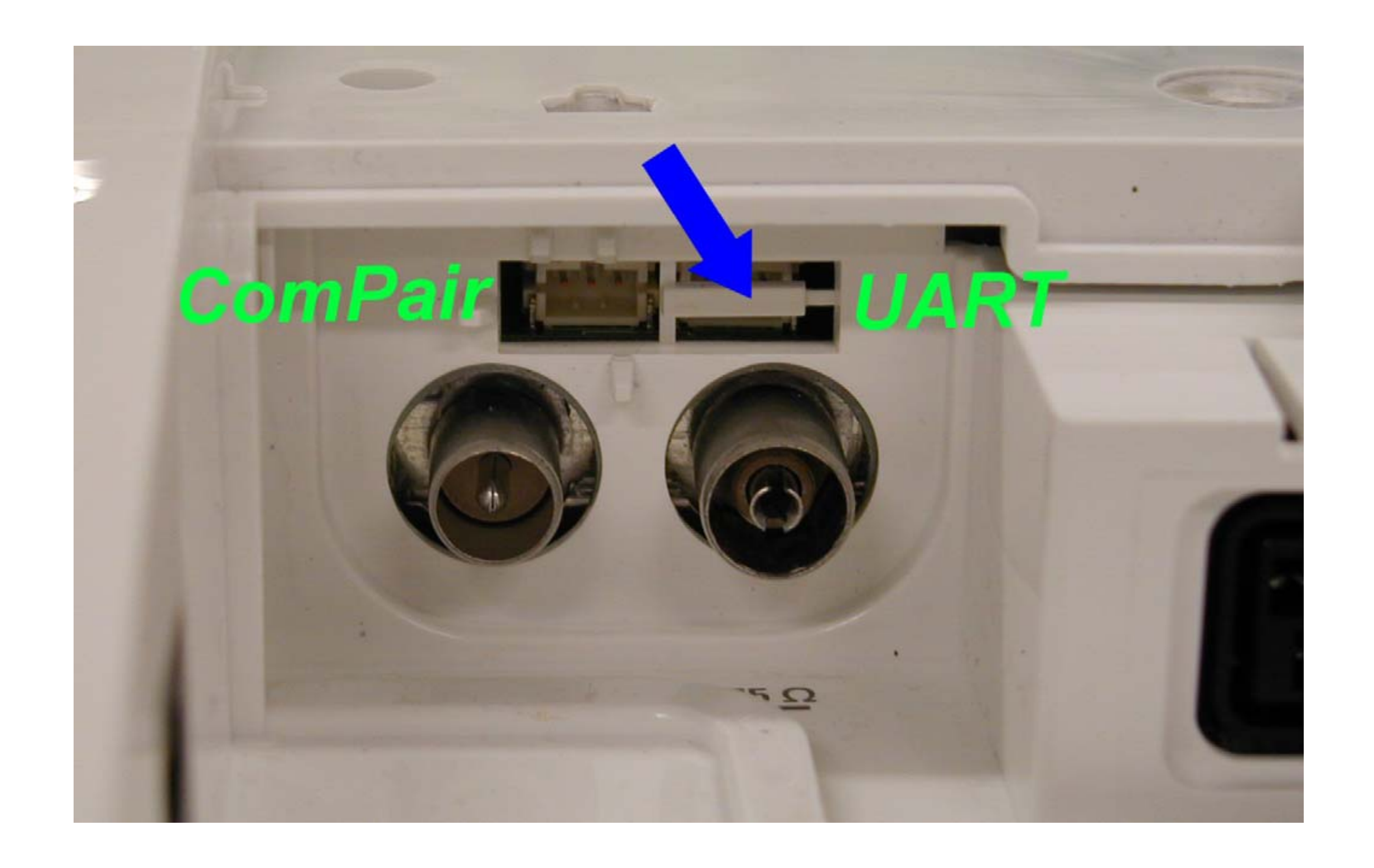
Nota: cuando la NVM se recarga, se deben ajustar los parámetros

ComPair



- Dos accesos localizados en la PCB
  - A la placa de televisión mediante un conector integrado
  - Al Scaler vía un conector UART
- Ambos son accesibles con o sin la tapa posterior
- Cables especiales:
  - Compair
    - 12NC: 3139 131 03790 (sólo para LC4.2)
  - UART
    - 12NC: 3122 785 90630

Conexiones ComPair



Actualización de software

- **Hercules** SW a través del conector de ComPair. Procedimiento:
  - Ir al SAM
  - Cambiar en la dirección 01(dec)de la NVM el dato a 170 (AA_{hex})
  - Activar el modo ComPair (en el SAM)
  - Empezar el proceso de descarga
- **Scaler** SW a través del conector UART
  - En construcción!

Instrucciones mecánicas



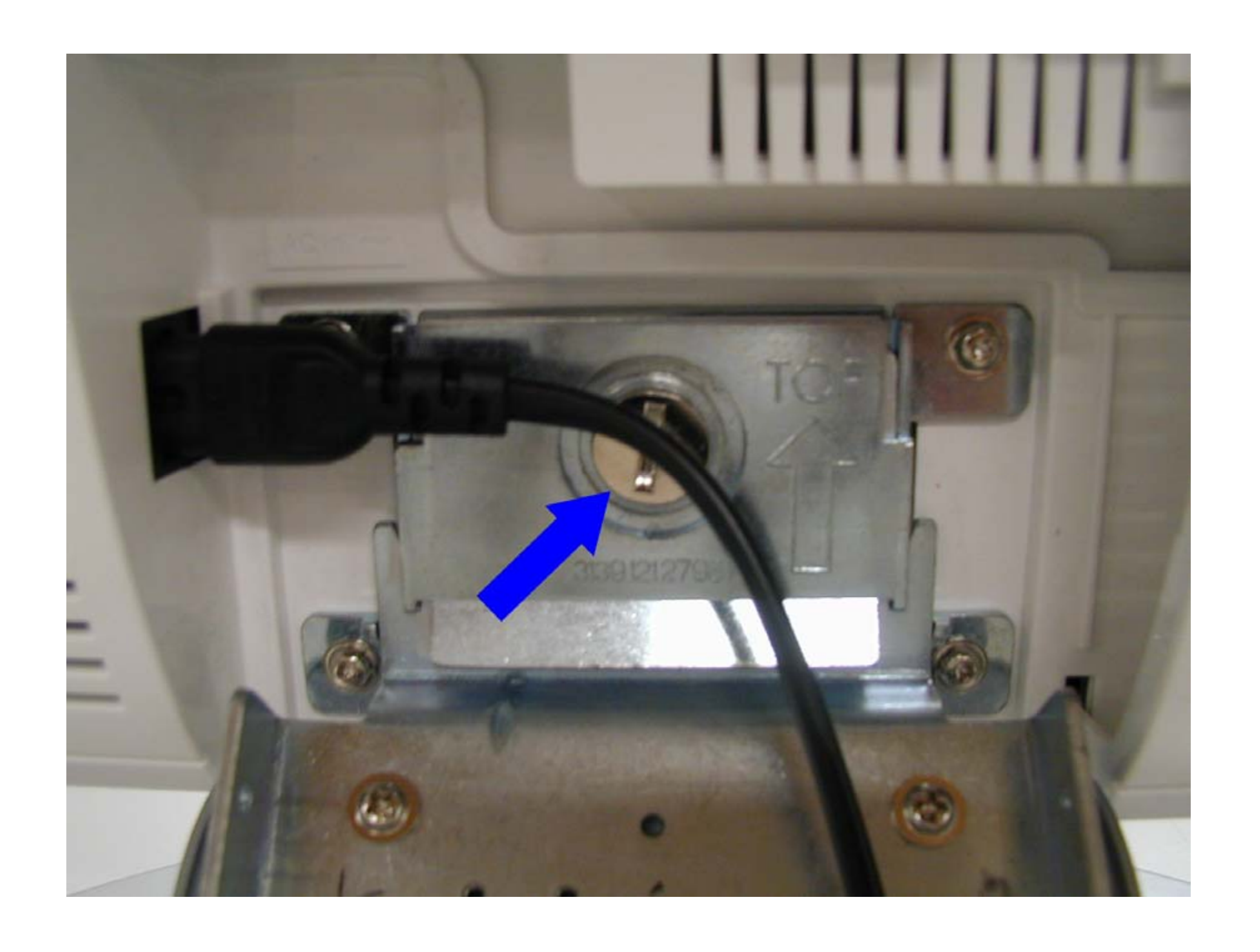
Instrucciones mecánicas



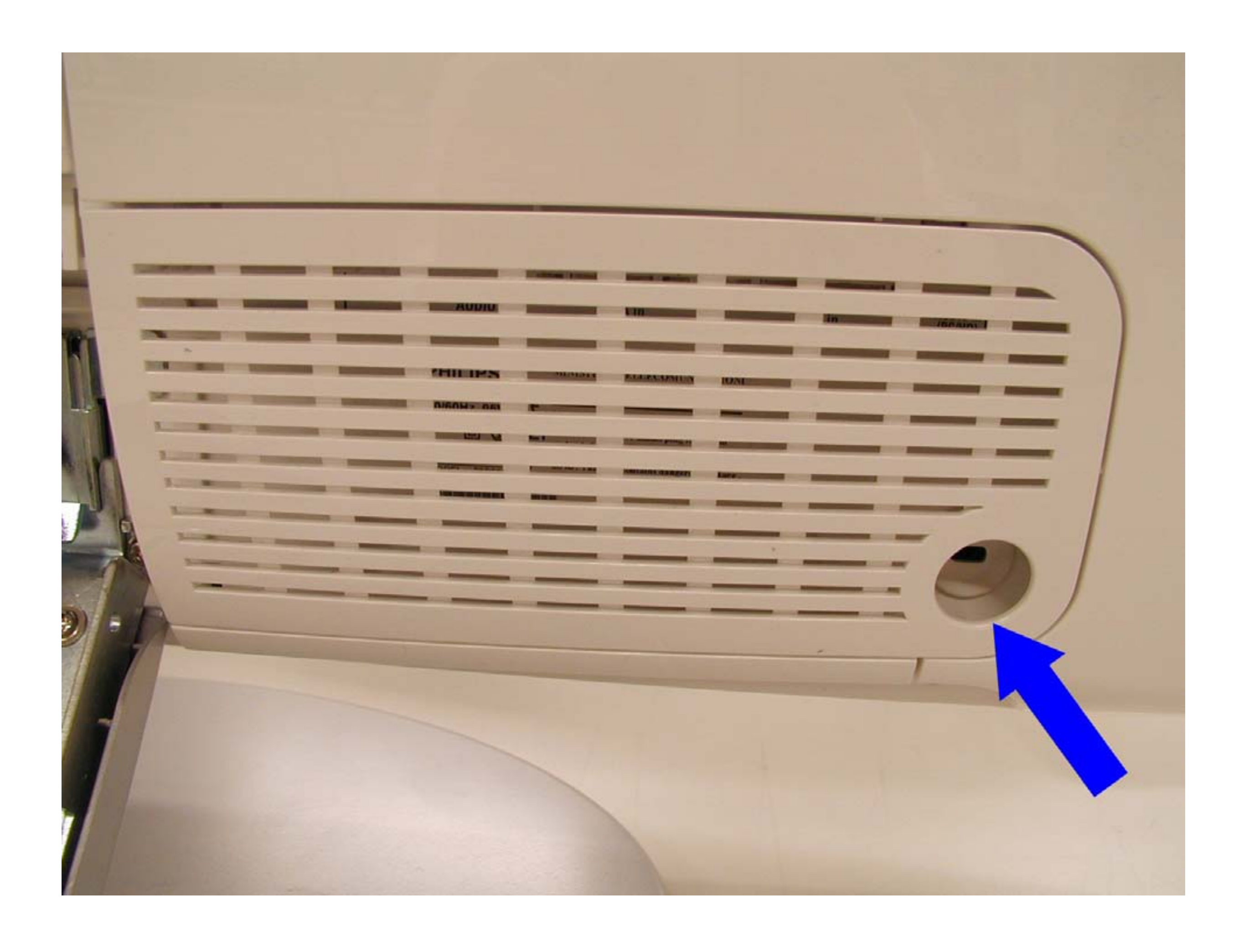
Instrucciones mecánicas



Instrucciones mecánicas



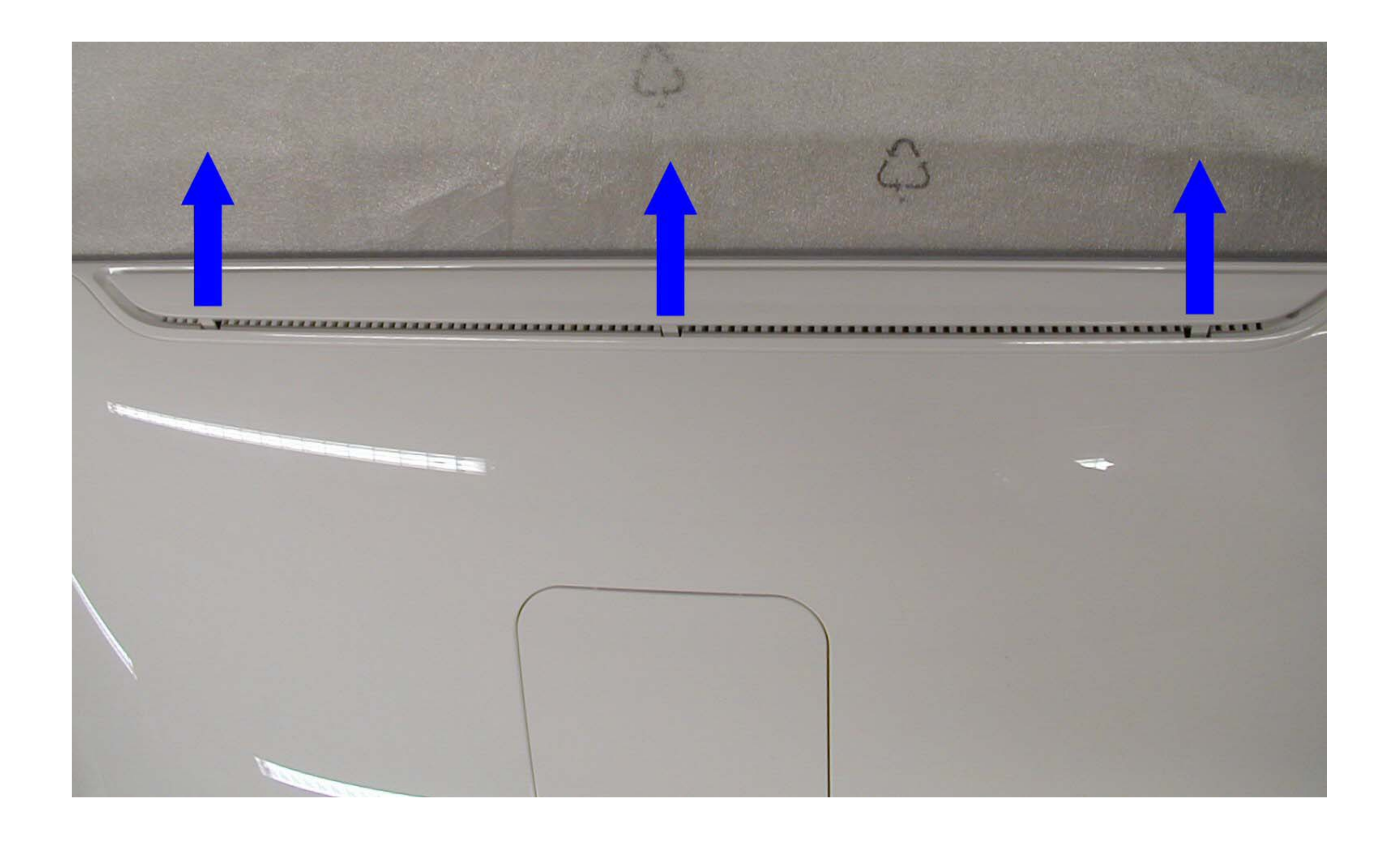
Instrucciones mecánicas



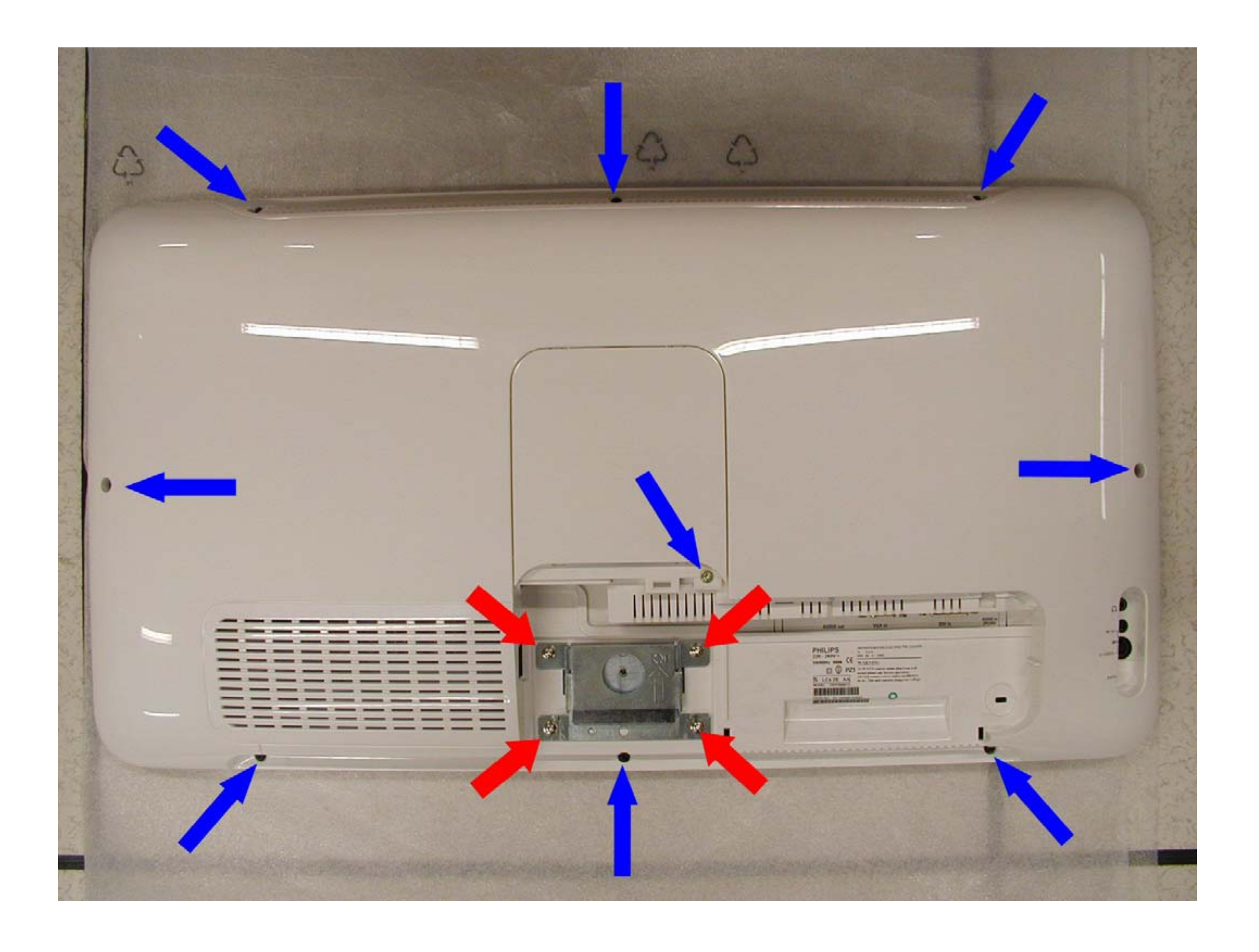
Instrucciones mecánicas



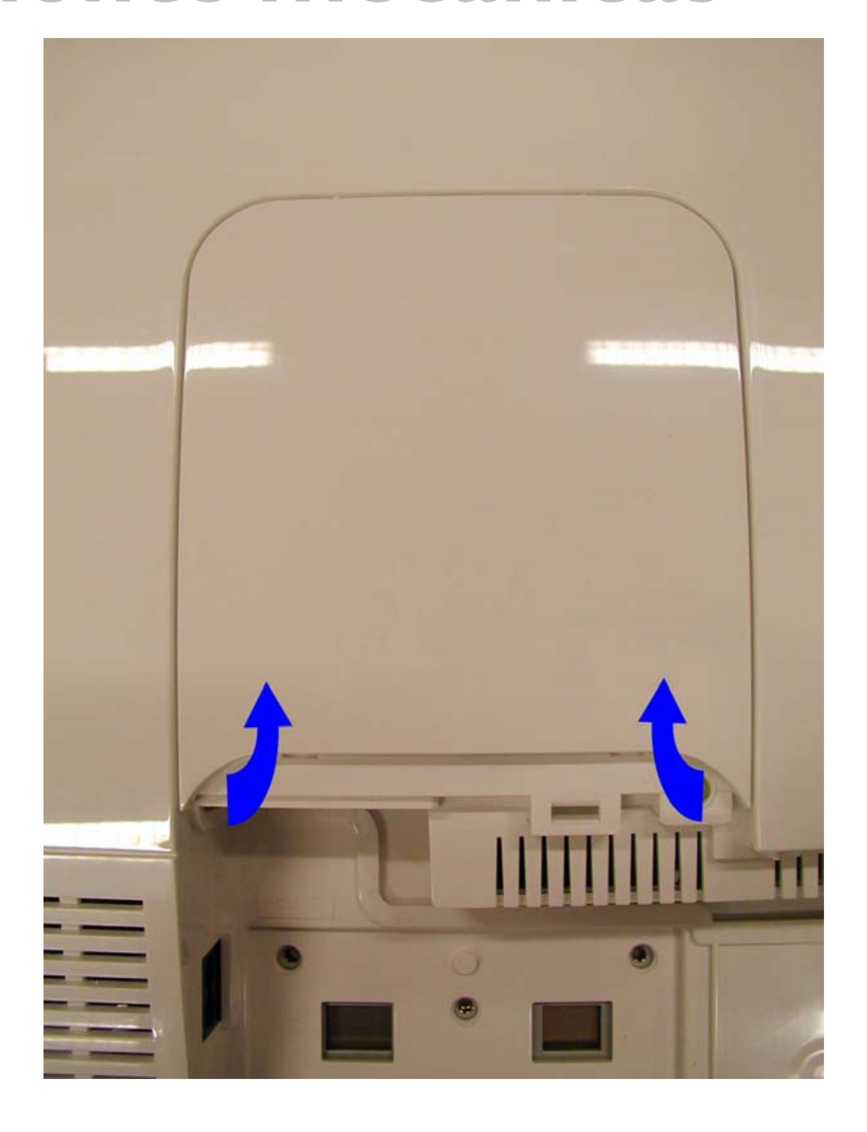
Instrucciones mecánicas



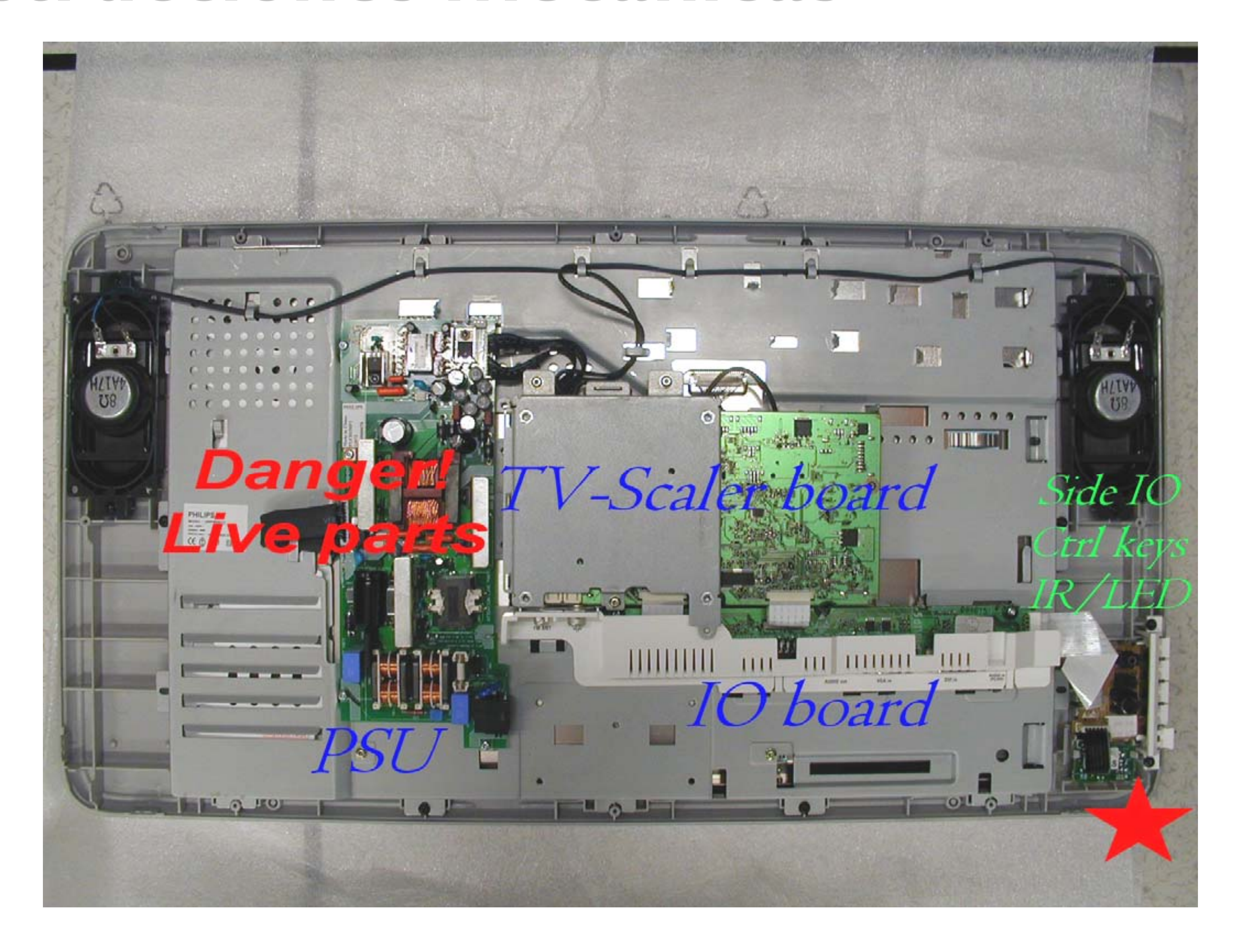
Instrucciones mecánicas



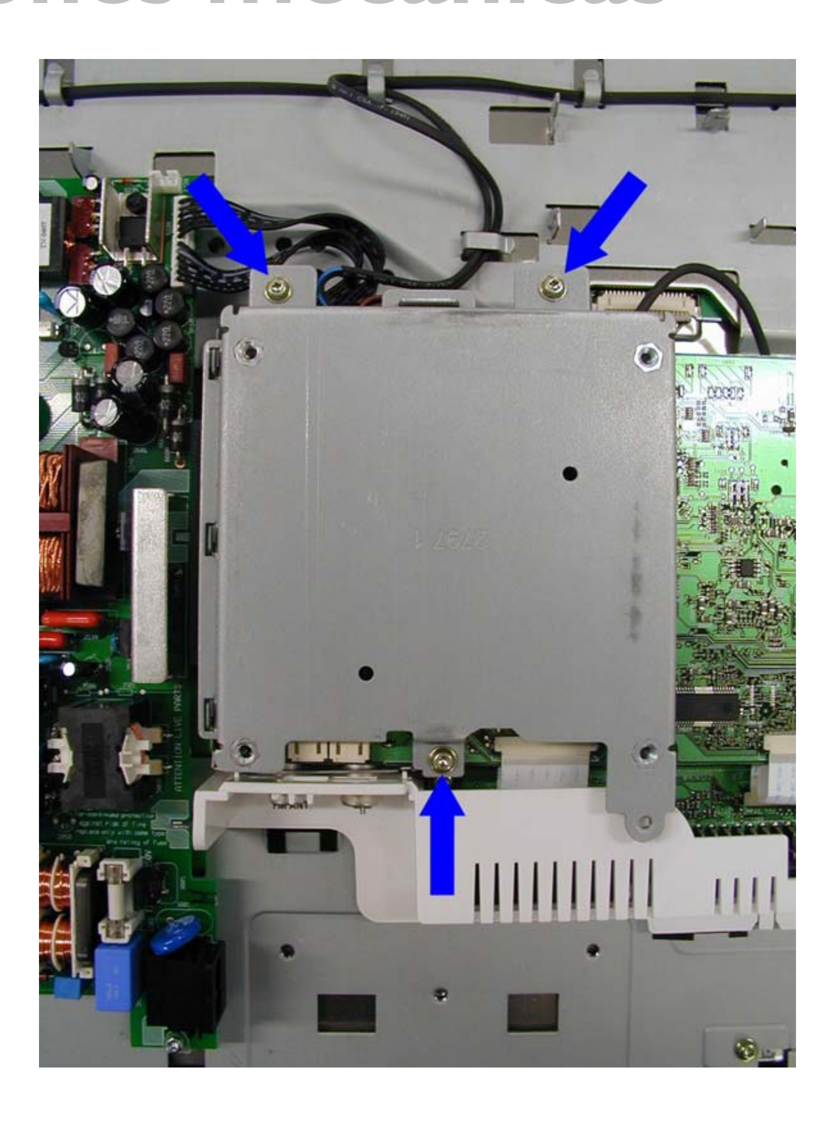
Instrucciones mecánicas



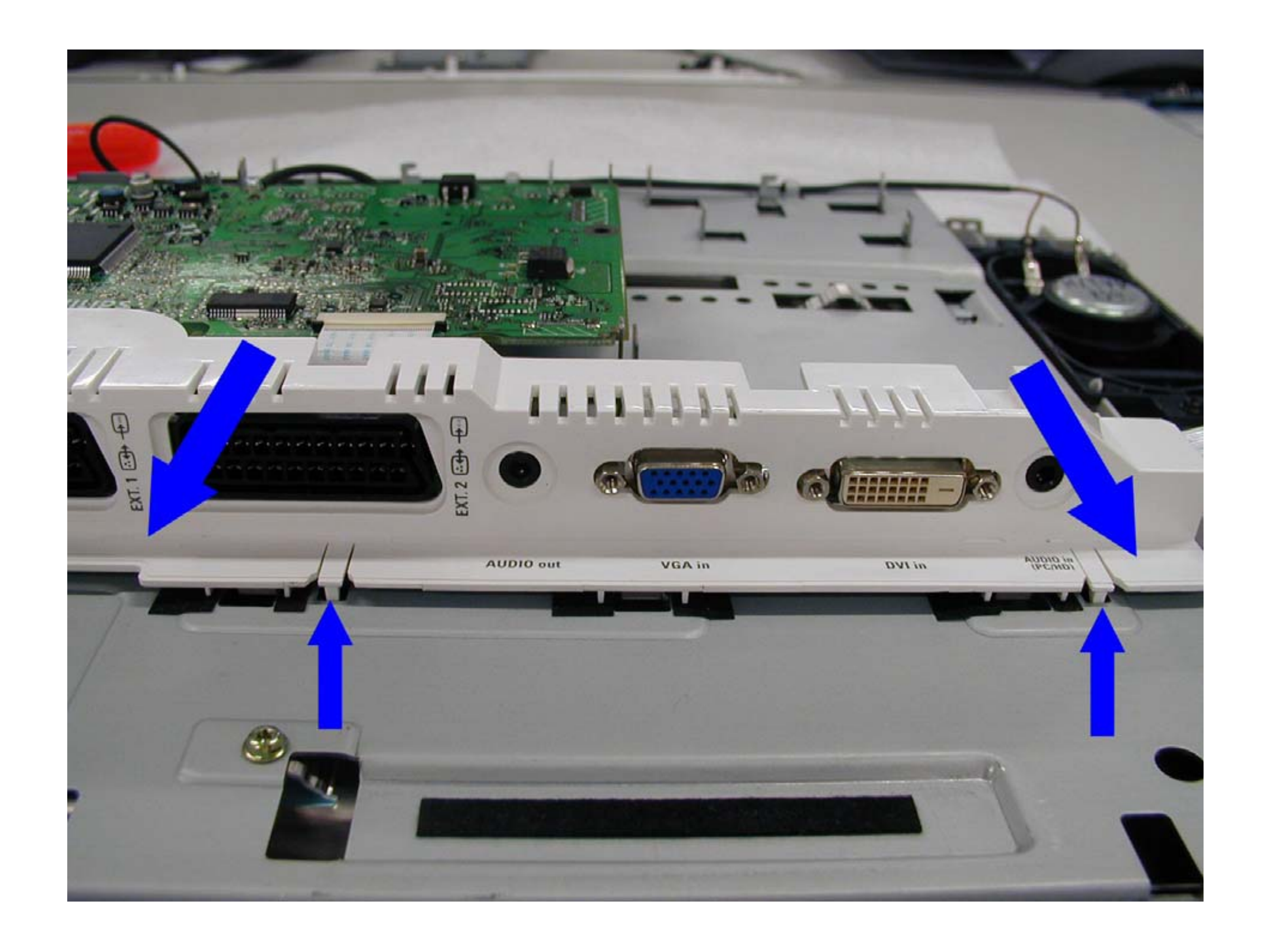
Instrucciones mecánicas



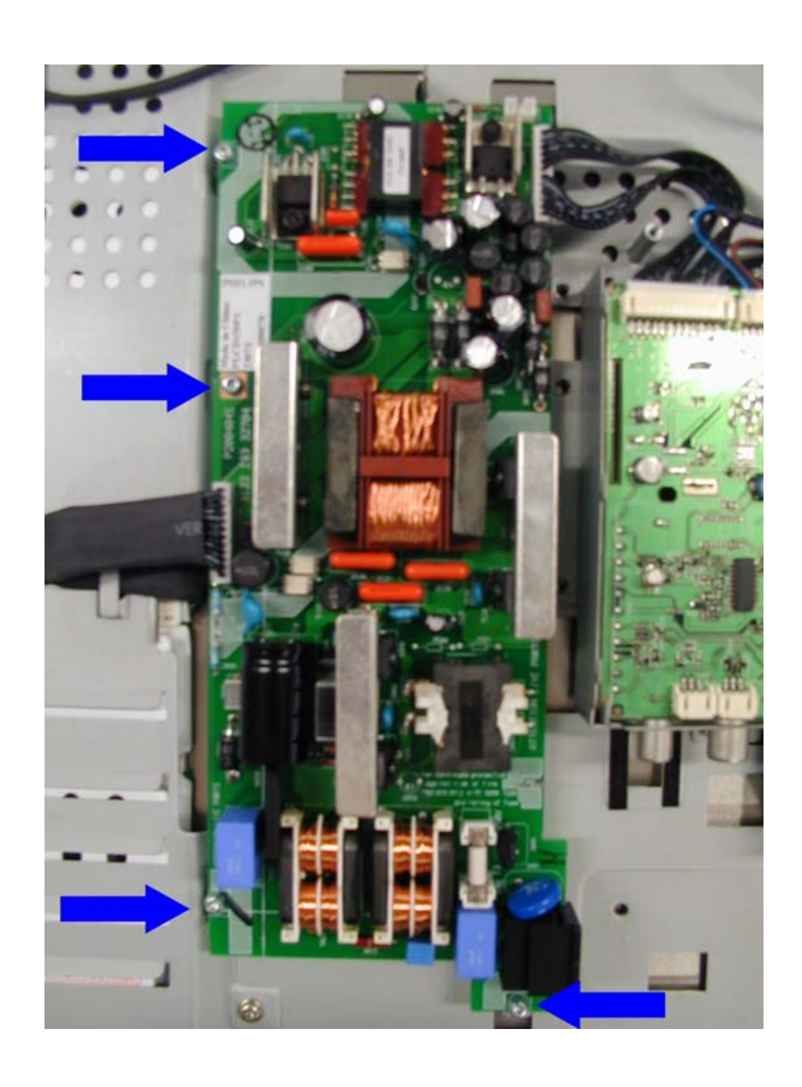
Instrucciones mecánicas



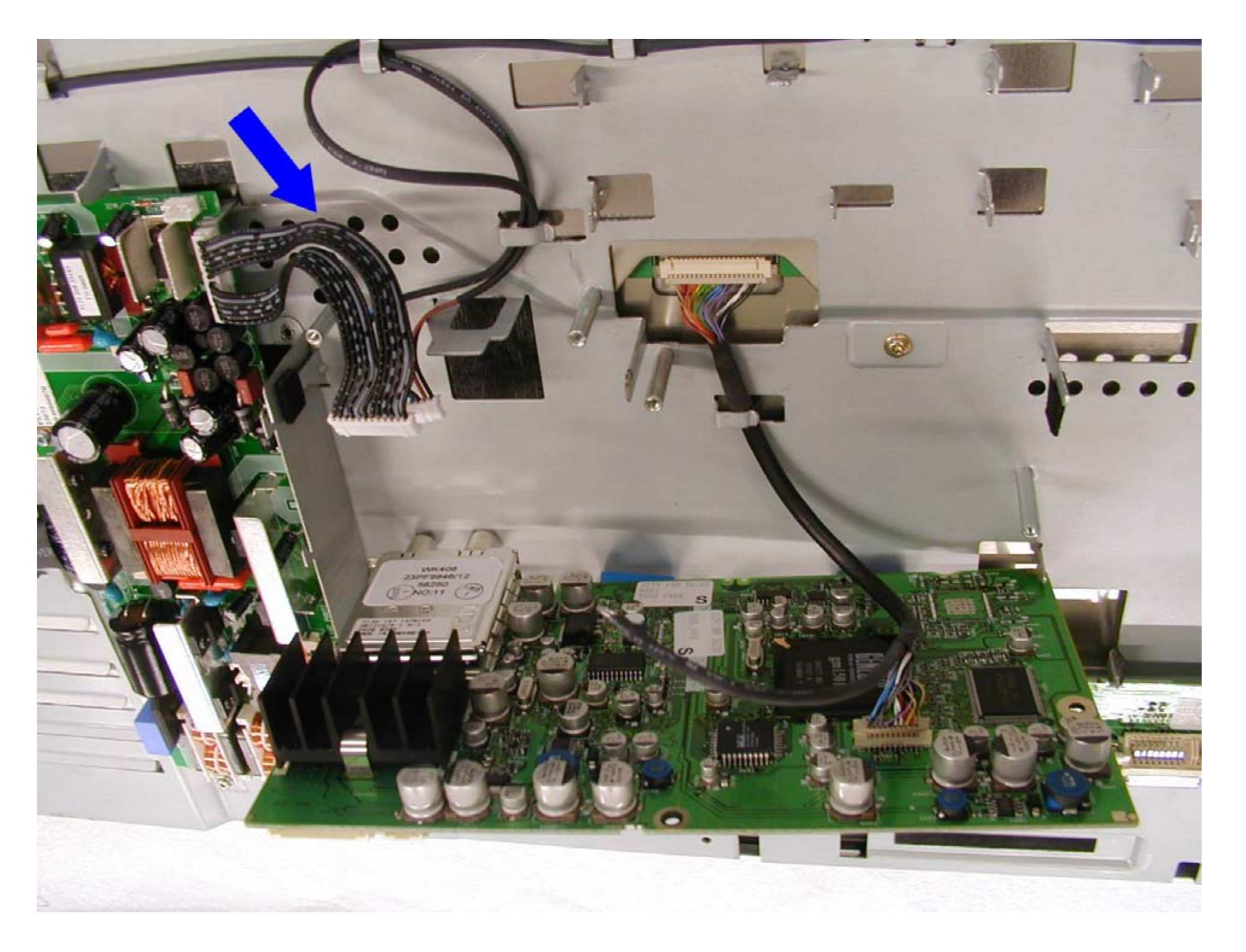
Instrucciones mecánicas



Instrucciones mecánicas

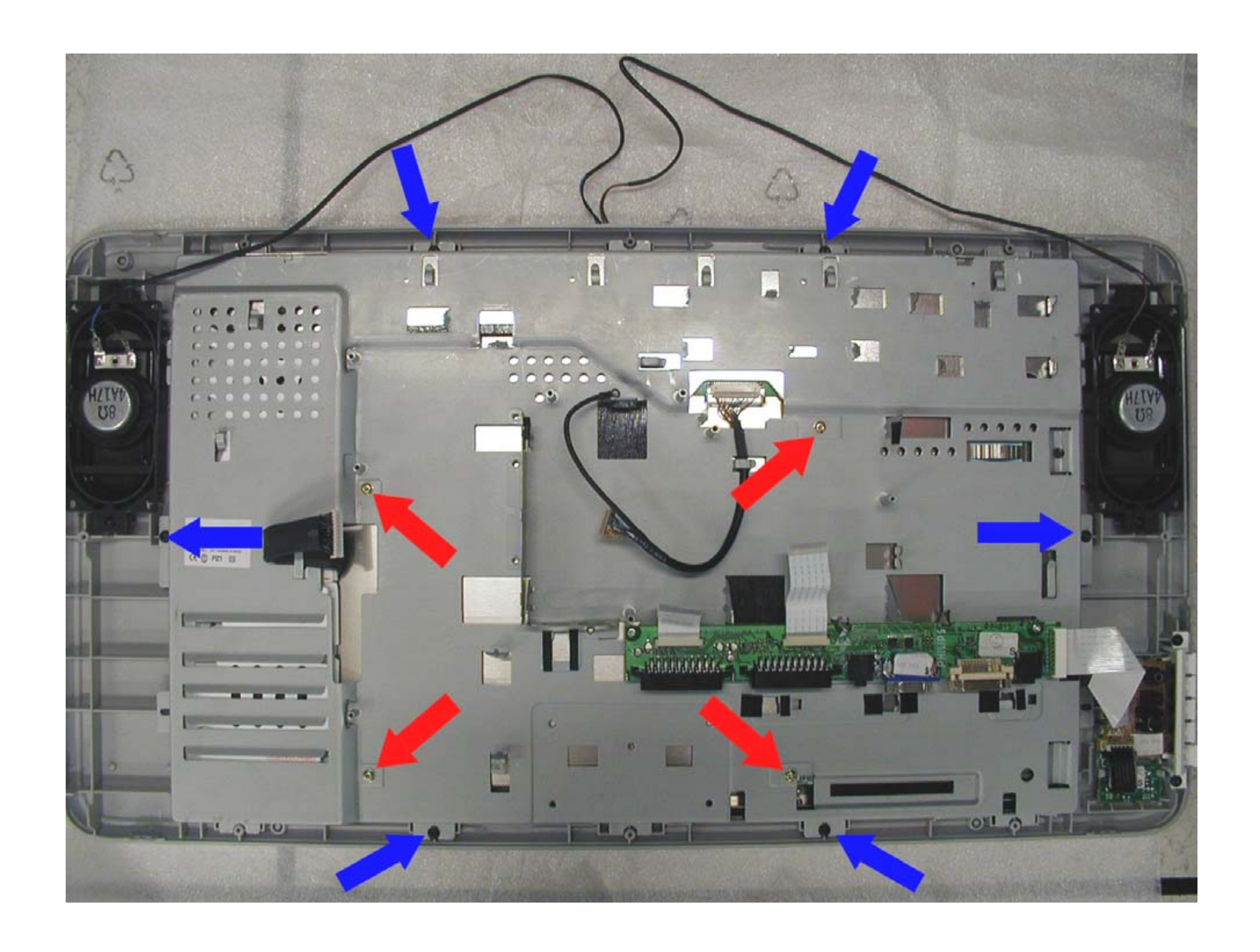


Instrucciones mecánicas

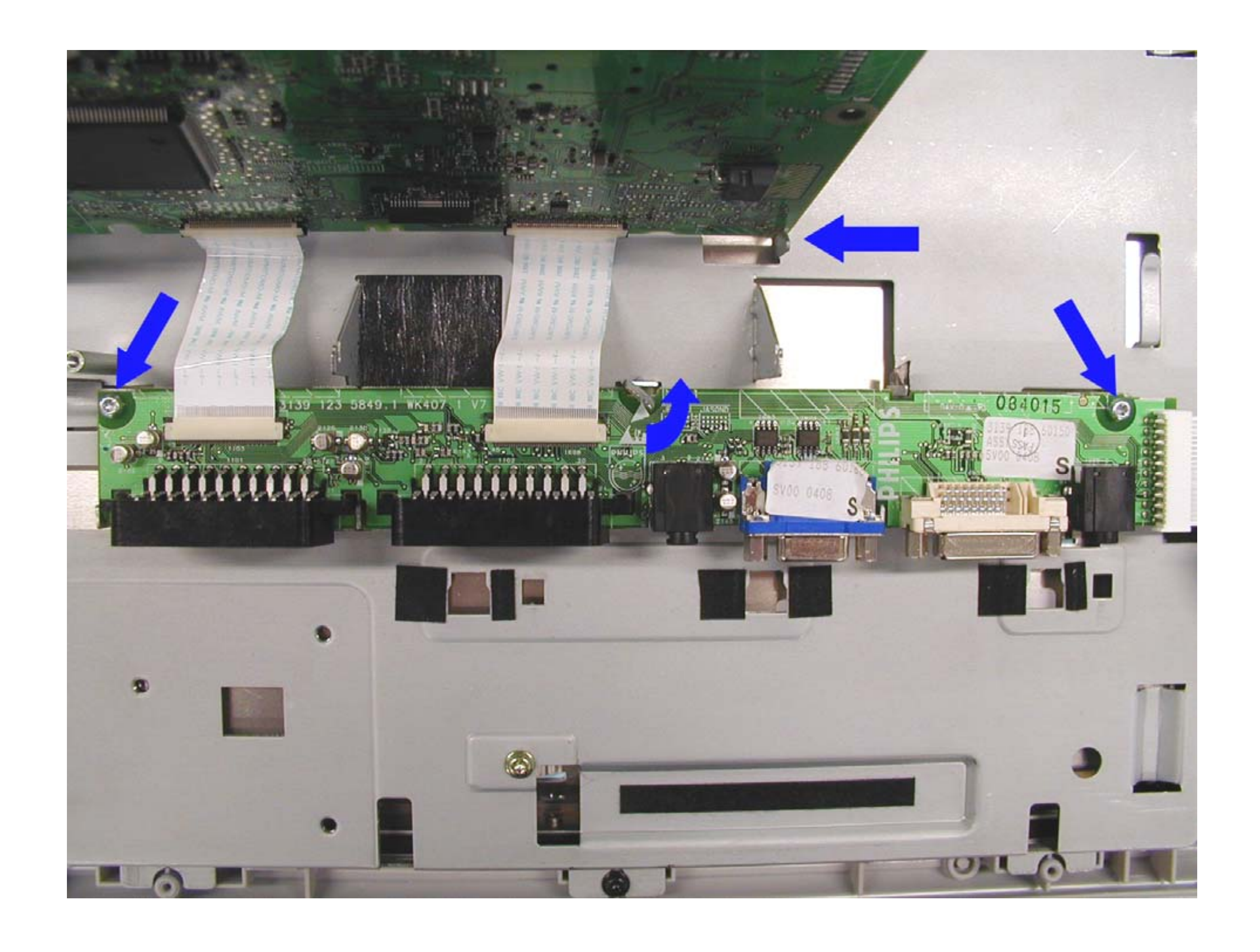


La conexión entre PSU y la placa TV-Scaler es demasiado corta para la posición de servicio. Se puede usar el extensor 12NC 3139 110 28311.

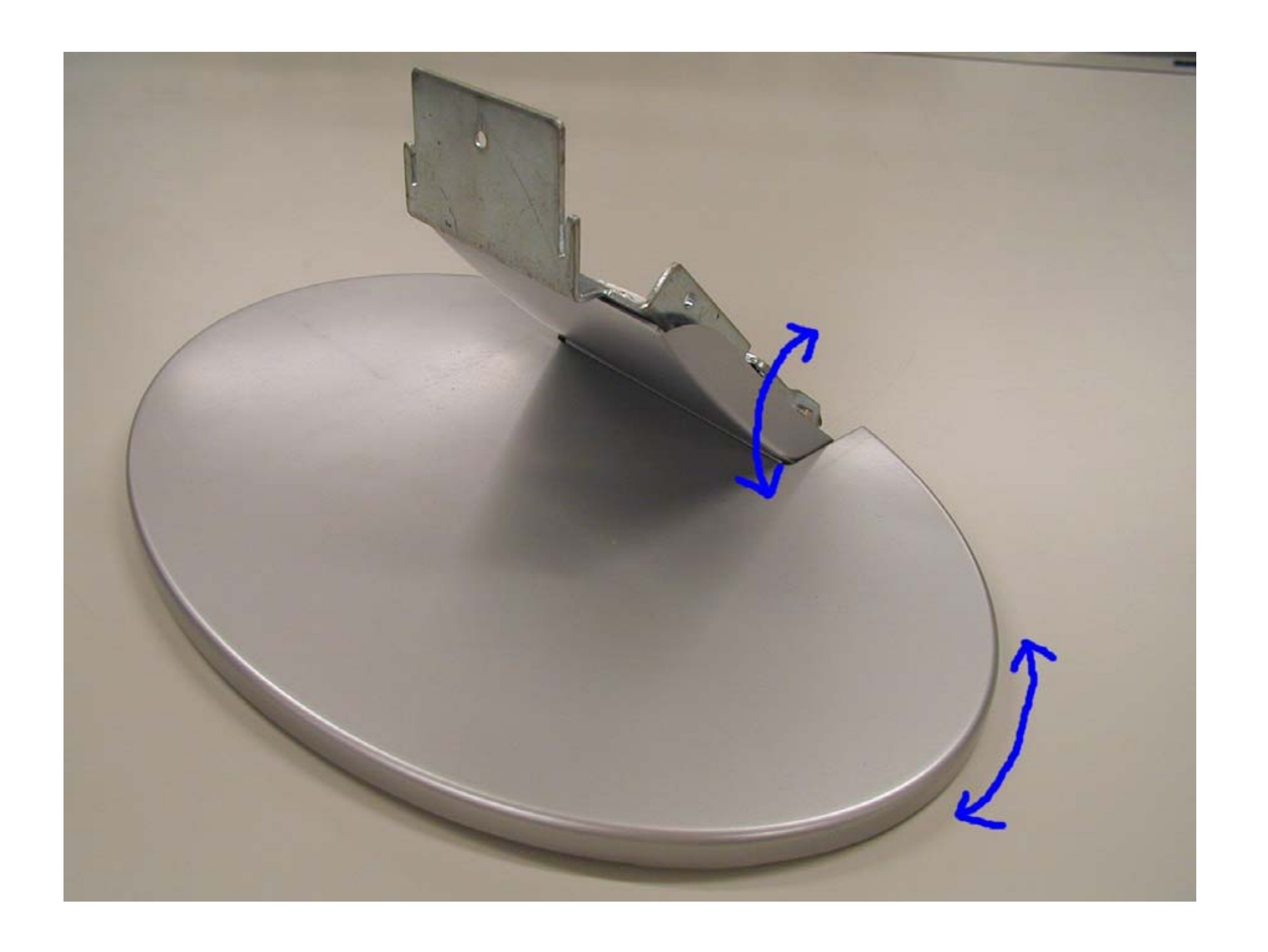
Instrucciones mecánicas

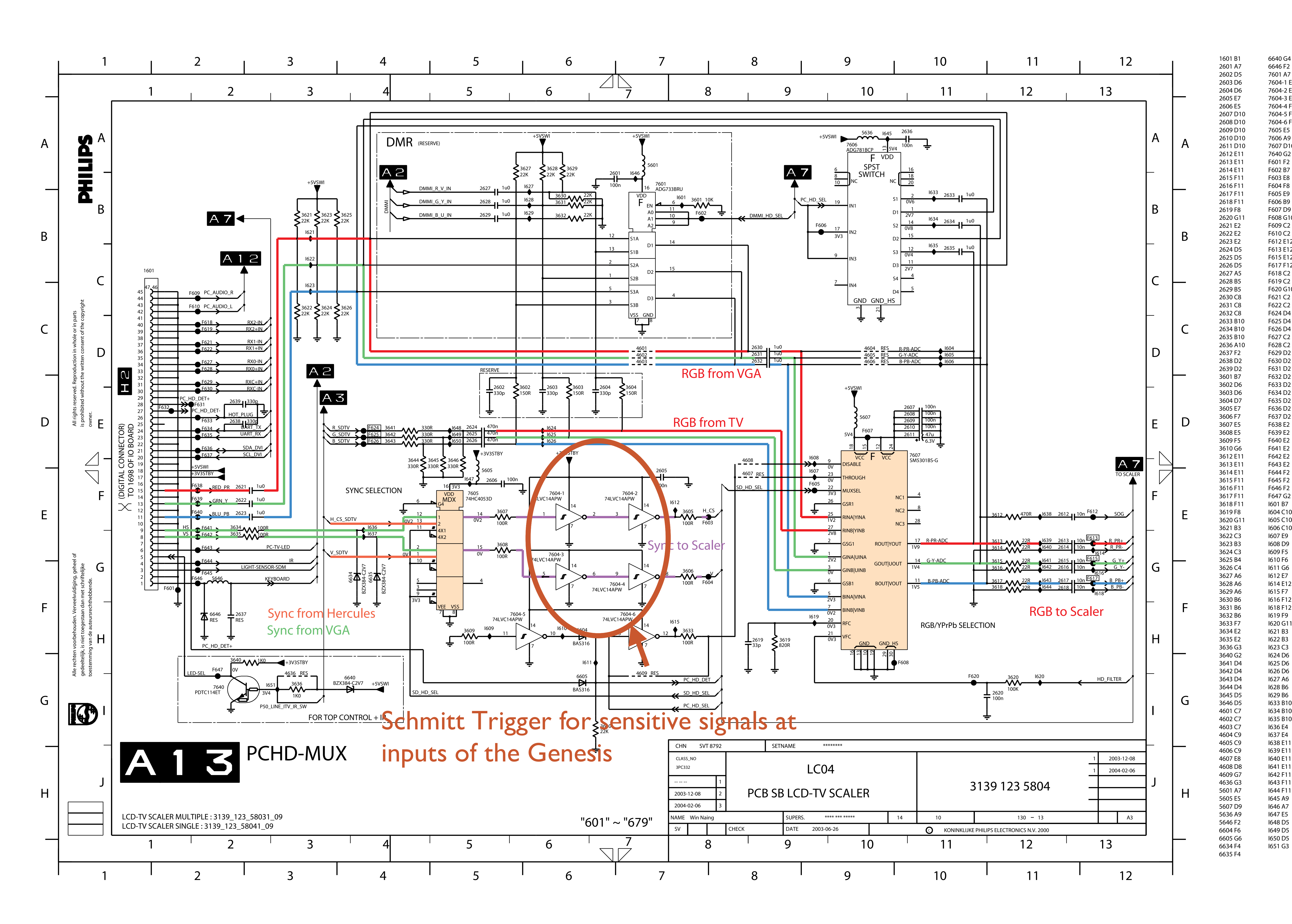


Instrucciones mecánicas



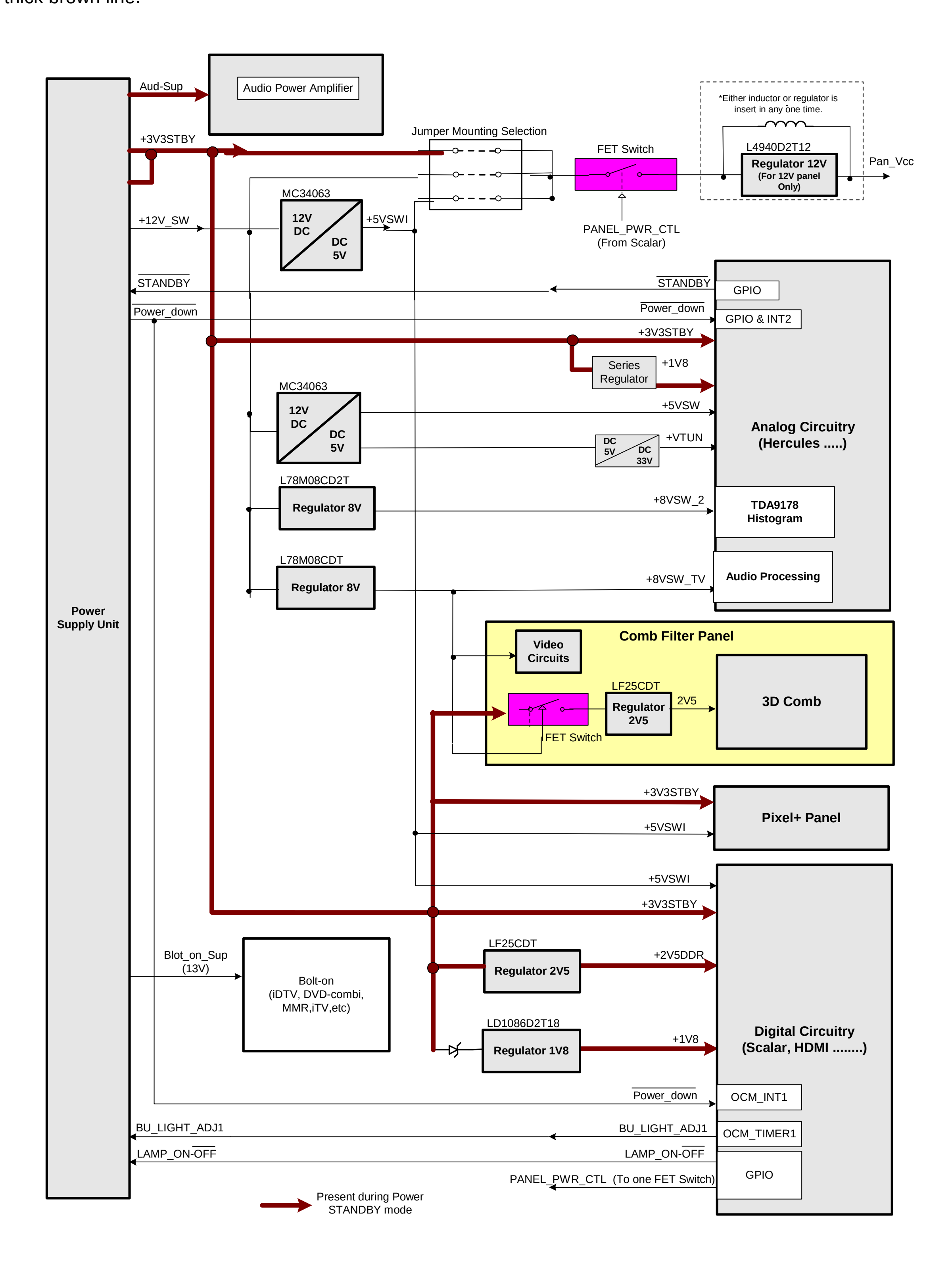
Instrucciones mecánicas




PHILIPS
DMR (RESERVE)
RGB from VGA
RGB from TV
Sync to Scaler
Sync from Hercules
Sync from VGA
SYNC SELECTION
RGB/YPrPb SELECTION
RGB to Scaler
Schmitt Trigger for sensitive signals at inputs of the Genesis
TO SCALER
FOR TOP CONTROL + IR
(DIGITAL CONNECTOR) TO 1698 OF IO BOARD
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Alle rechten voorbehouden. Verveelvuldiging, geheel of gedeeltelijk, is niet toegestaan dan met schriftelijke toestemming van de auteursrechthebbende.
A13 PCHD-MUX
LCD-TV SCALER MULTIPLE : 3139_123_58031_09
LCD-TV SCALER SINGLE : 3139_123_58041_09
"601" ~ "679"
CHN SVT 8792
SETNAME ********
CLASS_NO 3PC332
LC04
PCB SB LCD-TV SCALER
3139 123 5804
2003-12-08
2004-02-06
NAME Win Naing
SUPERS.
CHECK
DATE 2003-06-26
KONINKLIJKE PHILIPS ELECTRONICS N.V. 2000
1601 B1
2601 A7
2602 D5
2603 D6
2604 D6
2605 E7
2606 E5
2607 D10
2608 D10
2609 D10
2610 D10
2611 D10
2612 E11
2613 E11
2614 E11
2615 F11
2616 F11
2617 F11
2618 F11
2619 F8
2620 G11
2621 E2
2622 E2
2623 E2
2624 D5
2625 D5
2626 D5
2627 A5
2628 B5
2629 B5
2630 C8
2631 C8
2632 C8
2633 B10
2634 B10
2635 B10
2636 A10
2637 F2
2638 D2
2639 D2
3601 B7
3602 D6
3603 D6
3604 D7
3605 E7
3606 F7
3607 E5
3608 E5
3609 F5
3610 G6
3612 E11
3613 E11
3614 E11
3615 F11
3616 F11
3617 F11
3618 F11
3619 F8
3620 G11
3621 B3
3622 C3
3623 B3
3624 C3
3625 B4
3626 C4
3627 A6
3628 A6
3629 A6
3630 B6
3631 B6
3632 B6
3633 F7
3634 E2
3635 E2
3636 G3
3640 G2
3641 D4
3642 D4
3643 D4
3644 D5
3645 D5
3646 D5
4601 C7
4602 C7
4603 C7
4604 C9
4605 C9
4606 C9
4607 E8
4608 D8
4609 G7
4636 G3
5601 A7
5605 E5
5607 D9
5636 A9
5646 F2
6604 F6
6605 G6
6634 F4
6635 F4
6640 G4
6646 F2
7601 A7
7604-1 E6
7604-2 E7
7604-3 E6
7604-4 F7
7604-5 F6
7604-6 F7
7605 E5
7606 A9
7607 D10
7640 G2
F601 F2
F602 B7
F603 E8
F604 F8
F605 E9
F606 B9
F607 D9
F608 G10
F609 C2
F610 C2
F612 E12
F613 E12
F615 E12
F617 F12
F618 C2
F619 C2
F620 G10
F621 C2
F622 C2
F624 D4
F625 D4
F626 D4
F627 C2
F628 C2
F629 D2
F630 D2
F631 D2
F632 D2
F633 D2
F634 D2
F635 D2
F636 D2
F637 D2
F638 E2
F639 E2
F640 E2
F641 E2
F642 E2
F643 F2
F644 F2
F645 F2
F646 F2
F647 G2
I601 B7
I604 C10
I605 C10
I606 C10
I607 E9
I608 D9
I609 F5
I610 F6
I611 G6
I612 E7
I614 E12
I615 F7
I616 F12
I618 F12
I619 F9
I620 G11
I621 B3
I622 B3
I623 C3
I624 D6
I625 D6
I626 D6
I627 A6
I628 B6
I629 B6
I633 B10
I634 B10
I635 B10
I636 E4
I637 E4
I638 E11
I639 E11
I640 E11
I641 E11
I642 F11
I643 F11
I644 F11
I645 A9
I646 A7
I647 E5
I648 D5
I649 D5
I650 D5
I651 G3

Power Supply architecture

On standby, only the 3V3 and Audio supply are available from the PSU. This is shown in the below diagram highlighted in thick brown line.



LC04V Platform : Power Supply Block Diagram

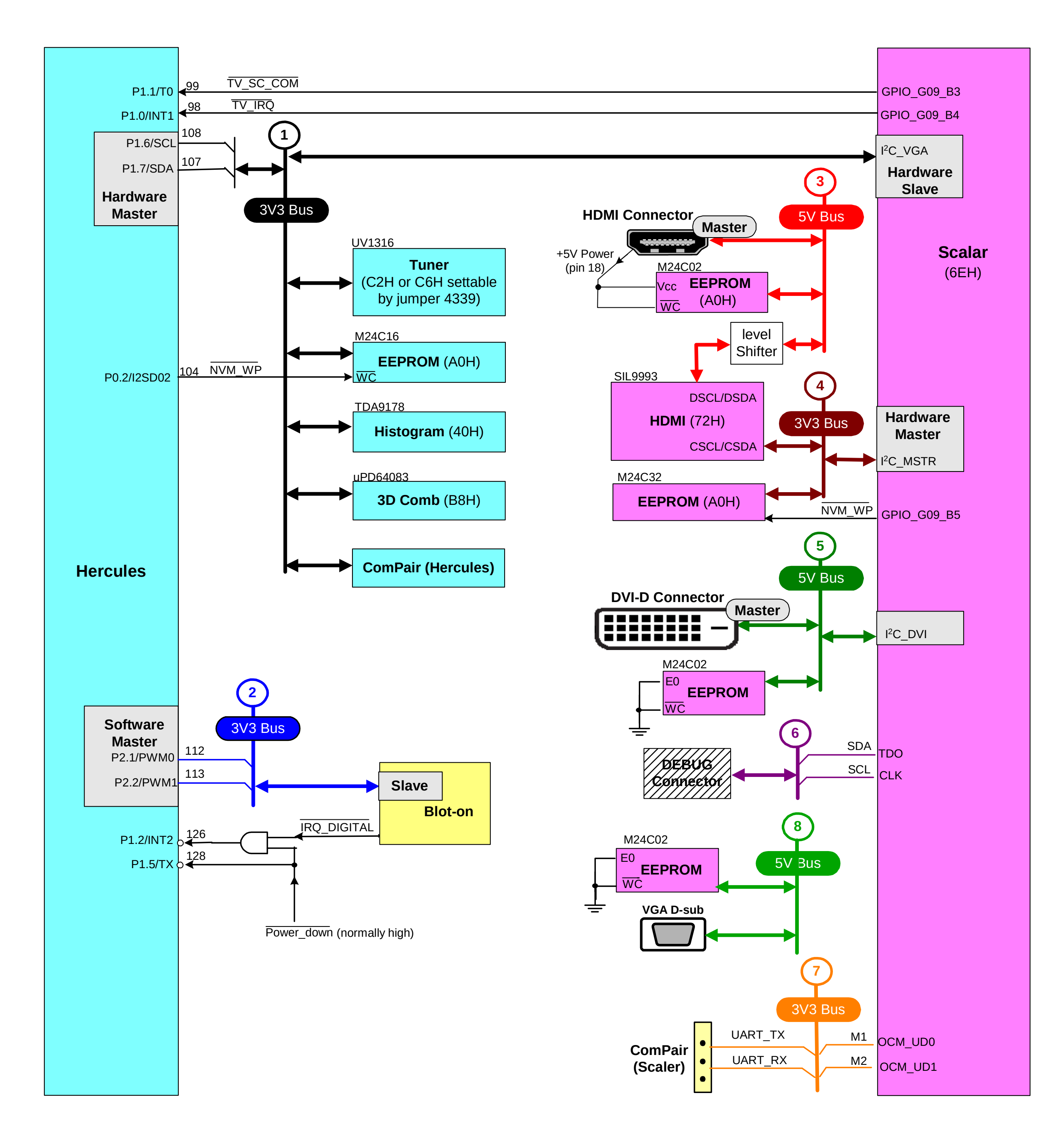


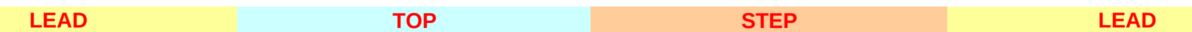
Figure Platform : I²C Bus Diagram

	Description	Test Location	Specs			Unit
1	**DC Supply**		**Min**	**Typ**	**Max**	
1.1a	+12V main supply	1910		12		V
1.1b	+3V3STBY	1910		3.3		V
1.1c	AUD_SUP	1910		10		V
1.2a	+5VSWTV Regulator out	5932 and 2935		5		V
1.2b	+VTUN Regulator out	2911				V
1.2c	+5VSW Regulator out	2958 and 5954		5		V
1.3	+8VSW_TV Regulator out	7920 out and 2921				V
1.4	+2V5 Regulator out	7992 out		2.5		V
1.5	+1V8Regulator out	7995 out		1.8		V
1.6	PAN-VCC	7953 out		12		V
1.7a	+3V3 at LVDS	5991		3.3		V
1.7b	+3V3 at LVDSA	5989		3.3		V
1.7c	+3V3 at LVDSB	5990		3.3		V
1.7d	+3V3 at LBADC	5988		3.3		V
1.7e	+3V3 at IO	5987		3.3		V

[Back To List](#)

FLAT TV

	TOP	STEP	TOP	STEP
				
	LCD TV	LCD TV	LCD TV	LCD TV
Type no.	**26PF9956**	**26PF9946**	**23PF9956**	**23PF9946**
Chassis	LC04 V	LC04 V	LC04 V	LC04 V
PICTURE QUALITY				
Panel	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT
Number of Pixels	1280x768 (*3)	1280x768 (*3)	1280x768 (*3)	1280x768 (*3)
Brightness	450 cd/m²	450 cd/m²	450 cd/m²	450 cd/m²
Contrast Ratio	400:1	400:1	400:1	400:1
Response Time	16 ms	16 ms	25 ms	25 ms
Viewing Angles H/V	176/176	176/176	176/176	176/176
Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass
Pixel Plus	**Pixel Plus**	-	**Pixel Plus**	-
Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan
Digital Crystal Clear/Crystal Clear III	Digital Crystal Clear	Digital Crystal Clear	Digital Crystal Clear	Digital Crystal Clear
Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor
Combfilter	2D Comb Filter	2D Comb Filter	2D Comb Filter	2D Comb Filter
SOUND QUALITY				
Dolby Virtual	Dolby Virtual	Dolby Virtual	Dolby Virtual	Dolby Virtual
Incredible Surround	-	-	-	-
Power output (RMS Watts)	10 W RMS	10 W RMS	10 W RMS	10 W RMS
Number of on board Speakers	2 on board speakers	2 on board speakers	2 on board speakers	2 on board speakers
EASE OF USE INSTALLATION				
Plug & Play	Plug & Play	Plug & Play	Plug & Play	Plug & Play
PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning
100 Presets Channels	100 Presets Channels	100 Presets Channels	100 Presets Channels	100 Presets Channels
Autostore	Autostore	Autostore	Autostore	Autostore
Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning
Sorting	Sorting	Sorting	Sorting	Sorting
Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI
EASE OF USE UTILISATION				
Top Controls	Top Controls	Top Controls	Top Controls	Top Controls
RC suitable for	Rc (DVD/AUX)	Rc (DVD/AUX)	Rc (DVD/AUX)	Rc (DVD/AUX)
RC Reference	RCAE049_FRP	RCAE049_FRP	RCAE049_FRP	RCAE049_FRP
Program List	-	-	-	-
Smart controls	Smart controls	Smart controls	Smart controls	Smart controls
Smart Listening (AVL + Delta Volume)	Smart Listening	Smart Listening	Smart Listening	Smart Listening
Dual I-II	Dual I-II	Dual I-II	Dual I-II	Dual I-II
6 Widescreen Modes	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen
16:9 compress/4:3 expand	-	-	-	-
Continuous zoom	-	-	-	-
WSSB	WSSB	WSSB	WSSB	WSSB
Smart Clock	-	-	-	-
Wake up Clock	-	-	-	-
Sleep Timer	-	-	-	-
Smart Lock (child + parental)	-	-	-	-
Screen Saver Digital Clock Display	Screen Saver Digital Clock Display	Screen Saver	Screen Saver Digital Clock Display	Screen Saver
CONNECTIONS				
Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback
AV Front/Side Connections	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in
Headphones	Headphones	Headphones	Headphones	Headphones
Number of Scart sockets	2 Scarts	2 Scarts	2 Scarts	2 Scarts
Audio out Constant Level	Audio out Constant Level	Audio out Constant Level	Audio out Constant Level	Audio out Constant Level
DVI-in	DVI-D in	DVI-D in	DVI-D in	DVI-D in
PC in	PC in	PC in	PC in	PC in
INFORMATION				
Smart Text	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)
Text Dual Screen	-	-	-	-
Twin Page Text	Twin Page Text	Twin Page Text	Twin Page Text	Twin Page Text
Picture In Picture	PIP, PBP, PIG	PIP, PBP, PIG	PIP, PBP, PIG	PIP, PBP, PIG
MISCELLANEOUS				
FM radio	**FM radio**	**FM radio**	**FM radio**	**FM radio**
MultiMedia Recorder	-	-	-	-
Operating power consumption	tbc	tbc	90W	90W
Standby power	1.5W	1.5W	1.5W	1.5W
Weight	15Kg	15 kg	11Kg	11 kg
Weight Including Packaging	19Kg	19 kg	15Kg	15 kg
Depth	11 cm (center)	11 cm (center)	9 cm	9 cm
Dimensions (w, h, d)	787x448x110 mm	787x448x110 mm	690x369x87 mm	690x369x87 mm
Box Dimensions (w,h,d)	881x578x313 mm	881x578x313 mm	784x504x270 mm	784x504x270 mm
Colour	Black semi gloss 80007	Pearl White Silver (11092)	Black semi gloss 80007	Pearl White Silver (11092)
Wall mounting bracket	VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)
Table top stand	Table top stand	Table top stand	Table top stand	Table top stand











LCD TV	LCD TV	LCD TV	LCD TV
23PF8946	**17MF9946**	**17PF9946**	**17PF8946**
LC04 C	LC04 V	LC04 V	LC04 C
LCD WXGA ASV Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA MVA Active Matrix TFT
1280x768 (*3)	1280x768 (*3)	1280x768 (*3)	1280x768 (*3)
450 cd/m²	450 cd/m²	450 cd/m²	450 cd/m²
500:1	400:1	400:1	600:1
21 ms	25 ms	25 ms	25 ms
176/176	176/176	176/176	170/170
Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass
-	-	-	-
Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan
Skin Tone Colour Correction	Digital Crystal Clear	Digital Crystal Clear	Skin Tone Colour Correction
-	Active Control / Light Sensor	Active Control / Light Sensor	-
2D Comb Filter	2D Comb Filter	2D Comb Filter	-
Dolby Virtual	Dolby Virtual	Dolby Virtual	Dolby Virtual
-	-	-	-
10 W RMS	6 W RMS	6 W RMS	**4 W RMS**
2 on board speakers	2 on board speakers	2 on board speakers	2 on board speakers
Plug & Play	Plug & Play	Plug & Play	Plug & Play
PLL	PLL Digital Tuning	PLL Digital Tuning	PLL
100	100 Presets Channels	100 Presets Channels	100
Autostore	Autostore	Autostore	Autostore
Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning
Sorting	Sorting	Sorting	Sorting
Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI
Top Controls	Top Controls	Top Controls	Top Controls
Rc (VCR/DVD)	Rc (DVD/AUX)	Rc (DVD/AUX)	Rc (VCR/DVD)
Zappa + (without hard cap)	RCAE049_FRP	RCAE049_FRP	**Zappa + (without hard cap)**
-	-	-	-
Smart controls	Smart controls	Smart controls	Smart controls
Smart Listening	Smart Listening	Smart Listening	Smart Listening
Dual I-II	Dual I-II	Dual I-II	Dual I-II
4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen
-	-	-	-
-	-	-	-
WSSB	WSSB	WSSB	WSSB
Smart Clock	-	**Smart Clock**	**Smart Clock**
Wake Up Clock	-	**Wake Up Clock**	**Wake Up Clock**
Sleep Timer	-	**Sleep Timer**	**Sleep Timer**
-	-	-	Smart Lock
Screen Saver	Screen Saver Digital Clock Display	Screen Saver Digital Clock Display	-
Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback
AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in
Headphones	Headphones	Headphones	Headphones
1 Scart	**1 Scarts**	2 Scarts	1 Scart
-	-	-	-
-	-	-	-
PC in	PC in	PC in	PC in
Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)
-	-	-	-
Twin Page Text	Twin Page Text	Twin Page Text	Twin Page Text
-	Picture In Graphic	PIP, PBP, PIG	-
FM radio	**FM radio**	**FM radio**	**FM radio**
-	**Digital Media Recorder (DMR)**	-	-
tbc	tbc	tbc	tbc
1.5W	1.5W	1.5W	1.5W
9,2 kg	6Kg	6 kg	6,4 kg
13,4 kg	8Kg	8 kg	9,4 kg
9cm	8 cm	8 cm	6 cm
704x373x87 mm	517x301x82 mm	517x301x82 mm	517x301x55 mm
798x507x280 mm	622x419x243 mm	622x419x243 mm	646x253x452 mm
Silver Gloss	Black semi gloss 80007	Pearl White Silver (11092)	**Silver Gloss**
VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)
Table top stand	Table top stand	Table top stand	Table top stand

LEAD	LEAD	LEAD	LEAD	LEAD	LEAD	LEAD
						

LCD TV	**LCD TV**	**LCD TV**	**LCD TV**	**LCD TV**	**LCD TV**	**LCD TV**
20PF8846	**20PF7846**	**15PF8946**	**15PF7835**	**14PF7835**	**14PF7846**	**14PF6826**
LC04 C	LC04 C	LC04 C	LC03 Special	LC03 Special	LC04 C	LC04 C
LCD VGA S-IPS Active Matrix TFT	LCD VGA S-IPS Active Matrix TFT	LCD XGA TN Active Matrix TFT	LCD XGA TN Active Matrix TFT	LCD VGA VA Active Matrix TFT	LCD VGA VA Active Matrix TFT	LCD VGA VA Active Matrix TFT
640x480 (*3)	640x480 (*3)	1024x768 (*3)	1024x768 (*3)	640x480 (*3)	640x480 (*3)	640x480 (*3)
450 cd/m²	450 cd/m²	450 cd/m²	450 cd/m²	450 cd/m²	450 cd/m²	450 cd/m²
350:1	350:1	400:1	400:1	500:1	500:1	500:1
25 ms	25 ms	16 ms tbc	16 ms tbc	16 ms	16 ms	16 ms
176/176	176/176	**130/100**	**130/100**	170/170	170/170	170/170
Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass
-	-	-	-	-	-	-
Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan
Skin Tone Colour Correction	Skin Tone Colour Correction	Skin Tone Colour Correction	-	-	Skin Tone Colour Correction	Skin Tone Colour Correction
-	-	-	DCDi by Faroudjia	DCDi by Faroudjia	-	-
2D Comb Filter	2D Comb Filter	-	-	-	-	-
Dolby Virtual	Dolby Virtual	Dolby Virtual	Stereo	Stereo	Dolby Virtual	Dolby Virtual
-	-	-	-	-	-	-
10 W RMS	**10 W RMS**	**4 W RMS**	6 W RMS	**4 W RMS**	**4 W RMS**	**4 W RMS**
2 on board speakers	2 on board speakers	2 on board speakers	2 on board speakers	2 on board speakers	2 on board speakers	2 on board speakers
Plug & Play	Plug & Play	Plug & Play	Plug & Play	Plug & Play	Plug & Play	Plug & Play
PLL	PLL	PLL	PLL	PLL	PLL	PLL
100	100	100	100	100	100	100
Autostore	Autostore	Autostore	Autostore	Autostore	Autostore	Autostore
Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning
Sorting	Sorting	Sorting	Sorting	Sorting	Sorting	Sorting
Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI
Top Controls	Top Controls	Top Controls	Top Controls	Top Controls	Top Controls	Top Controls
Zappa (TV)	Zappa (TV)	Rc (VCR/DVD)	RC TV	RC TV	Zappa (TV)	Zappa (TV)
tbc	tbc	**Zappa + (without hard cap)**	RCAE038	RCAE038	tbc	tbc
-	-	-	-	-	-	-
Smart controls	Smart controls	Smart controls	Smart controls	Smart controls	Smart controls	Smart controls
Smart Listening	Smart Listening	Smart Listening	Delta volume	Delta volume	Smart Listening	Smart Listening
Dual I-II	Dual I-II	Dual I-II	AVL / Dual I-II	AVL / Dual I-II	Dual I-II	Dual I-II
-	-	-	-	-	-	-
16:9 compress tbc /4:3 expand	16:9 compress tbc /4:3 expand	16:9 compress tbc /4:3 expand	16:9 compress tbc /4:3 expand	16:9 compress tbc /4:3 expand	16:9 compress tbc /4:3 expand	16:9 compress tbc /4:3 expand
-	-	-	-	-	-	-
-	-	-	-	-	-	-
Smart Clock	**Smart Clock**	**Smart Clock**	Smart Clock	Smart Clock	**Smart Clock**	**Smart Clock**
Wake Up Clock	**Wake Up Clock**	**Wake Up Clock**	Wake up Clock	Wake up Clock	**Wake Up Clock**	**Wake Up Clock**
Sleep Timer	**Sleep Timer**	**Sleep Timer**	Sleep Timer	Sleep Timer	**Sleep Timer**	**Sleep Timer**
Smart Lock	Smart Lock	Smart Lock	Smart Lock	Smart Lock	Smart Lock	Smart Lock
-	-	-			-	-
Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback
AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in tbc
Headphones	Headphones	Headphones	Headphones	Headphones	Headphones	Headphones
1 Scart	1 Scart	1 Scart	1 Scart	1 Scart	1 Scart	1 Scart
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	PC in	-	-	-	-
Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
FM radio	**FM radio**	**FM radio**	FM radio	FM radio	**FM radio**	**FM radio**
-	-	-	-	-	-	-
tbc	tbc	tbc	50 W / 12 Volt compatiblity	tbc	tbc	tbc
1.5W	1.5W	1.5W	1 W	1 W	1.5W	1.5W
tbc	5.4 kg	7 kg	4.7 Kg	tbc	tbc	4,6 kg
tbc	10 kg	tbc	7,1 kg	tbc	tbc	7,0 kg
7 cm	6 cm	7 cm	5,5 cm	5,5 cm	5,5 cm	6 cm
tbc	477,6x442x55 mm	481x307x65 mm	377x361x55 mm	377x361x55 mm	377x361x55 mm	333x325x55 mm
tbc	577x539x232 mm	tbc	435x431x238 mm	435x431x238 mm	435x431x238 mm	435x400x219 mm
Silver Gloss	Silver Frost (11027)	**Silver Gloss**	Silver Frost (11027)	Silver Frost (11027)	Silver Frost (11027)	Silver Frost (11027)
VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)	VESA standard (optional)	VESA standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)
Table top stand	Table top stand	Table top stand	Table top stand	Table top stand	Table top stand	Table top stand

Back To List

FLAT TV

	TOP	STEP	TOP	STEP	TOP
					
	LCD TV	LCD TV	LCD TV	LCD TV	LCD TV
Type no.	**26PF9956**	**26PF9946**	**23PF9956**	**23PF9946**	**17MF9946**
Chassis	LC04 V	LC04 V	LC04 V	LC04 V	LC04 V
PICTURE QUALITY					
Panel	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT
Number of Pixels	1280x768 (*3)	1280x768 (*3)	1280x768 (*3)	1280x768 (*3)	1280x768 (*3)
Brightness	450 cd/m²	450 cd/m²	450 cd/m²	450 cd/m²	450 cd/m²
Contrast Ratio	400:1	400:1	400:1	400:1	400:1
Response Time	16 ms	16 ms	25 ms	25 ms	25 ms
Viewing Angles H/V	176/176	176/176	176/176	176/176	176/176
Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass
Pixel Plus	**Pixel Plus**	-	**Pixel Plus**	-	-
Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan
Digital Crystal Clear/Crystal Clear III	Digital Crystal Clear	Digital Crystal Clear	Digital Crystal Clear	Digital Crystal Clear	Digital Crystal Clear
Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor
Combfilter	2D Comb Filter	2D Comb Filter	2D Comb Filter	2D Comb Filter	2D Comb Filter
SOUND QUALITY					
Dolby Virtual	Dolby Virtual	Dolby Virtual	Dolby Virtual	Dolby Virtual	Dolby Virtual
Incredible Surround	-	-	-	-	-
Power output (RMS Watts)	10 W RMS	10 W RMS	10 W RMS	10 W RMS	6 W RMS
Number of on board Speakers	2 on board speakers	2 on board speakers	2 on board speakers	2 on board speakers	2 on board speakers
EASE OF USE INSTALLATION					
Plug & Play	Plug & Play	Plug & Play	Plug & Play	Plug & Play	Plug & Play
PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning
100 Presets Channels	100 Presets Channels	100 Presets Channels	100 Presets Channels	100 Presets Channels	100 Presets Channels
Autostore	Autostore	Autostore	Autostore	Autostore	Autostore
Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning
Sorting	Sorting	Sorting	Sorting	Sorting	Sorting
Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI
EASE OF USE UTILISATION					
Top Controls	Top Controls	Top Controls	Top Controls	Top Controls	Top Controls
RC suitable for	Rc (DVD/AUX)	Rc (DVD/AUX)	Rc (DVD/AUX)	Rc (DVD/AUX)	Rc (DVD/AUX)
RC Reference	RCAE049_FRP	RCAE049_FRP	RCAE049_FRP	RCAE049_FRP	RCAE049_FRP
Program List	-	-	-	-	-
Smart controls	Smart controls	Smart controls	Smart controls	Smart controls	Smart controls
Smart Listening (AVL + Delta Volume)	Smart Listening	Smart Listening	Smart Listening	Smart Listening	Smart Listening
Dual I-II	Dual I-II	Dual I-II	Dual I-II	Dual I-II	Dual I-II
6 Widescreen Modes	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen
16:9 compress/4:3 expand	-	-	-	-	-
Continuous zoom	-	-	-	-	-
WSSB	WSSB	WSSB	WSSB	WSSB	WSSB
Smart Clock	-	-	-	-	-
Wake up Clock	-	-	-	-	-
Sleep Timer	-	-	-	-	-
Smart Lock (child + parental)	-	-	-	-	-
Screen Saver Digital Clock Display	Screen Saver Digital Clock Display	Screen Saver	Screen Saver Digital Clock Display	Screen Saver	Screen Saver Digital Clock Display
CONNECTIONS					
Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback
AV Front/Side Connections	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in
Headphones	Headphones	Headphones	Headphones	Headphones	Headphones
Number of Scart sockets	2 Scarts	2 Scarts	2 Scarts	2 Scarts	**1 Scarts**
Audio out Constant Level	Audio out Constant Level	Audio out Constant Level	Audio out Constant Level	Audio out Constant Level	-
DVI-in	DVI-D in	DVI-D in	DVI-D in	DVI-D in	-
PC in	PC in	PC in	PC in	PC in	PC in
INFORMATION					
Smart Text	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)
Text Dual Screen	-	-	-	-	-
Twin Page Text	Twin Page Text	Twin Page Text	Twin Page Text	Twin Page Text	Twin Page Text
Picture In Picture	PIP, PBP, PIG	PIP, PBP, PIG	PIP, PBP, PIG	PIP, PBP, PIG	Picture In Graphic
MISCELLANEOUS					
FM radio	**FM radio**	**FM radio**	**FM radio**	**FM radio**	**FM radio**
MultiMedia Recorder	-	-	-	-	**Digital Media Recorder (DMR)**
Operating power consumption	tbc	tbc	90W	90W	tbc
Standby power	1.5W	1.5W	1.5W	1.5W	1.5W
Weight	15Kg	15 kg	11Kg	11 kg	6Kg
Weight Including Packaging	19Kg	19 kg	15Kg	15 kg	8Kg
Depth	11 cm (center)	11 cm (center)	9 cm	9 cm	8 cm
Dimensions (w, h, d)	787x448x110 mm	787x448x110 mm	690x369x87 mm	690x369x87 mm	517x301x82 mm
Box Dimensions (w,h,d)	881x578x313 mm	881x578x313 mm	784x504x270 mm	784x504x270 mm	622x419x243 mm
Colour	Black semi gloss 80007	Pearl White Silver (11092)	Black semi gloss 80007	Pearl White Silver (11092)	Black semi gloss 80007
Wall mounting bracket	VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)
Table top stand	Table top stand	Table top stand	Table top stand	Table top stand	Table top stand

STEP



LCD TV
17PF9946 LC04 V
LCD WXGA S-IPS Active Matrix TFT
1280x768 (*3)
450 cd/m²
400:1
25 ms
176/176
Anti Reflex Coated Glass
-
Progressive Scan
Digital Crystal Clear
Active Control / Light Sensor
2D Comb Filter
Dolby Virtual
-
6 W RMS
2 on board speakers
Plug & Play
PLL Digital Tuning
100 Presets Channels
Autostore
Fine Tuning
Sorting
Smart ATS/ACI
Top Controls
Rc (DVD/AUX)
RCAE049_FRP
-
Smart controls
Smart Listening
Dual I-II
4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen
-
-
WSSB
Smart Clock
Wake Up Clock
Sleep Timer
-
Screen Saver Digital Clock Display
Full NTSC playback
AV Connections / SVHS- in
Headphones
2 Scarts
-
-
PC in
Smart Text (10 page)
-
Twin Page Text
PIP, PBP, PIG
FM radio
-
tbc
1.5W
6 kg
8 kg
8 cm
517x301x82 mm
622x419x243 mm
Pearl White Silver (11092)
VESA 100 standard (optional)
Table top stand

Overall Power States

In general there are three possible power super states for the LC04, each super-state is further break down into sub-states as follows:

- Power off
  - i. Passive-off
  - ii. Active-off
- Power on
  - i. Normal (TV, FM or HD-mode)
  - ii. Factory
  - iii. Service
  - iv. PC
- Standby
  - i. Normal (TV, FM or HD-mode)
  - ii. Protection

    C-Sleep

This section will describe the power states visible to the user. Entry to Factory and Service states are covered in the respective Requirement Specifications [4] and [5] respectively.

OFF Mode (Passive)

Name	Description
Passive-OFF mode	Power supplies status in set OFF mode.

In Passive-OFF mode, the set is completely switched off from mains. This means disconnecting the TV from the mains by pulling out the mains cable. Depending upon the last Standby Status (stored in NVM), this mode can transit to “ON’ mode, “STANDBY” mode or “ACTIVE-OFF” mode. For NAFTA, only transition to “Active-OFF” mode is allowed.

OFF Mode (Active)

Name	Description
Active-OFF mode	Power supplies status in Active-OFF mode. All LED indicators is switch off. TV is not reproducing video/graphics or sound.

In Active-OFF mode, the set is connected to the mains and the set is consuming the minimum power possible. This is similar to the set in STANDBY-NORMAL mode, but all LED indicators are switch off. For NAFTA set, this mode can transit to “ON” via the Power ON/FF button or, via the IR’s standby key. For all other regions, only the Power ON/OFF button allow the system to transit to the “ON” or “STANDBY” mode.

ON Mode (Normal)

Name	Description
Power ON mode	Power supplies status in set ON mode. The TV is reproducing video (non-PC application), and/or audio to its speaker. Video sources include the DVI connector, HDMI connecter and a HD(YPbPr) input via a RCA-to-VGA adaptor

This is the normal operating mode. All the power supply lines are available. All the circuits in the set are active. From this mode it shall be possible to transit to “STANDBY-NORMAL”, “SEMI-STANDBY”, “PROTECTION” or “OFF” mode.

ON Mode (PC)

Name	Description
Power PC-ON mode	Power supplies status in set PC-ON mode. The TV is used as a PC monitor through the VGA or DVI-D or HDMI(via a DVI-HDMI adaptor) input connector.

This is the normal PC operating mode. All the power supply lines are available. All the circuits in the set are active. From this mode it shall be possible to transit to “PC-SLEEP” via DMPS or DMPM power management, or “OFF” mode.

STANDBY Mode (Normal)

Name	Description
Power STANDBY-NORMAL mode	Power supplies status in set STANDBY-NORAML mode

The total power consumption of the TV set in this mode shall be equal or less than 3 Watts (“Energy Star” requirement up to 1 Jul 2005). The Standby-normal State will be indicated by the red LED. In this state only Hercules, Scaler, RAM, Program Memory, NVM and all means to wakeup the set are powered. Rest of the LC04 Sub-Systems shall be disconnected. A control port STAND-BY is defined to control to this effect (refer to LC04 Control HSI for details).

In this mode the UOC^{III}, Scaler and peripherals shall be set to the lowest power consumption mode by software.

From this mode it shall be possible to transit to “ON or “OFF” mode.

STANDBY Mode (Protection)

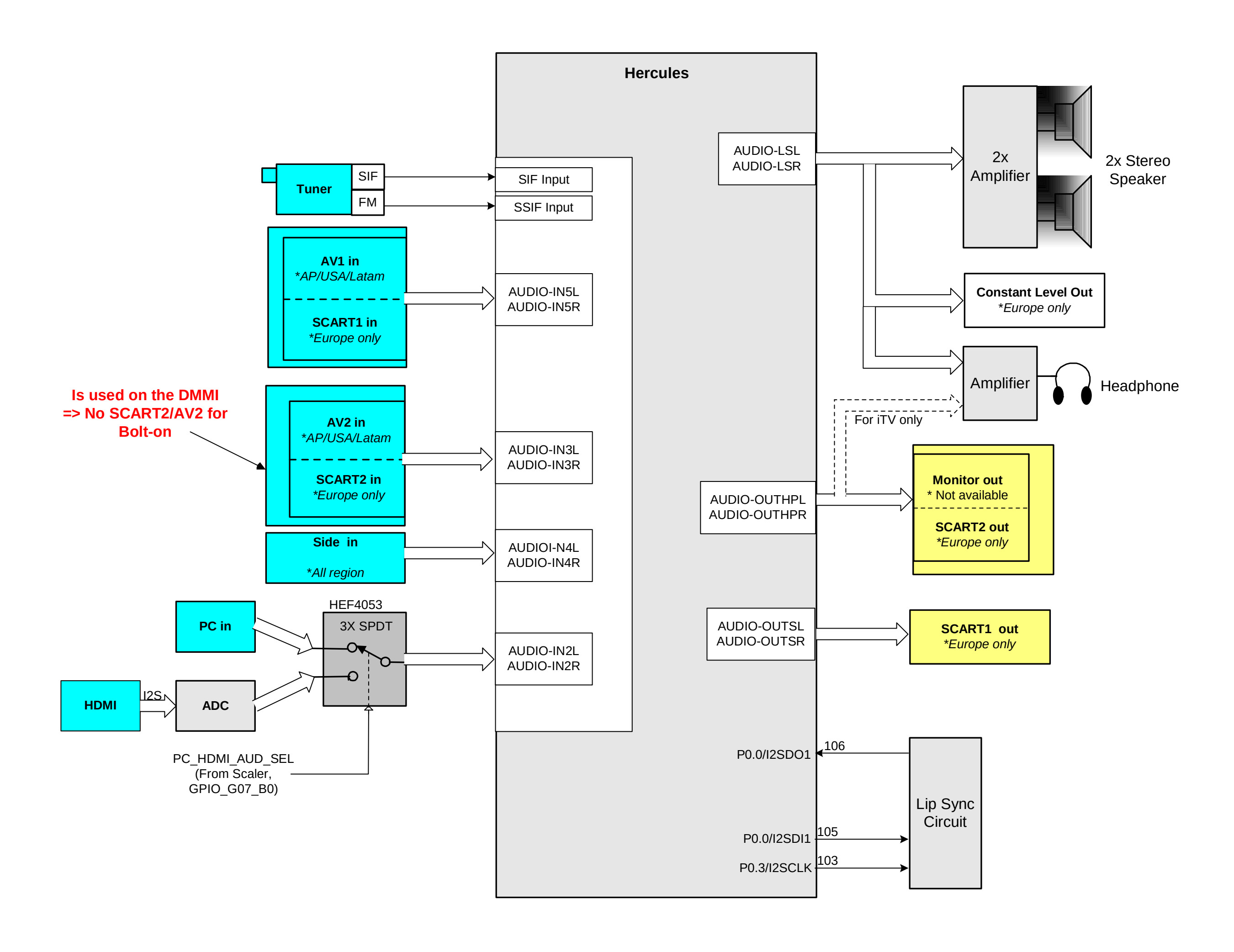
Name	Description
Power PROTECTION mode	Power supplies status in set PROTECTION mode

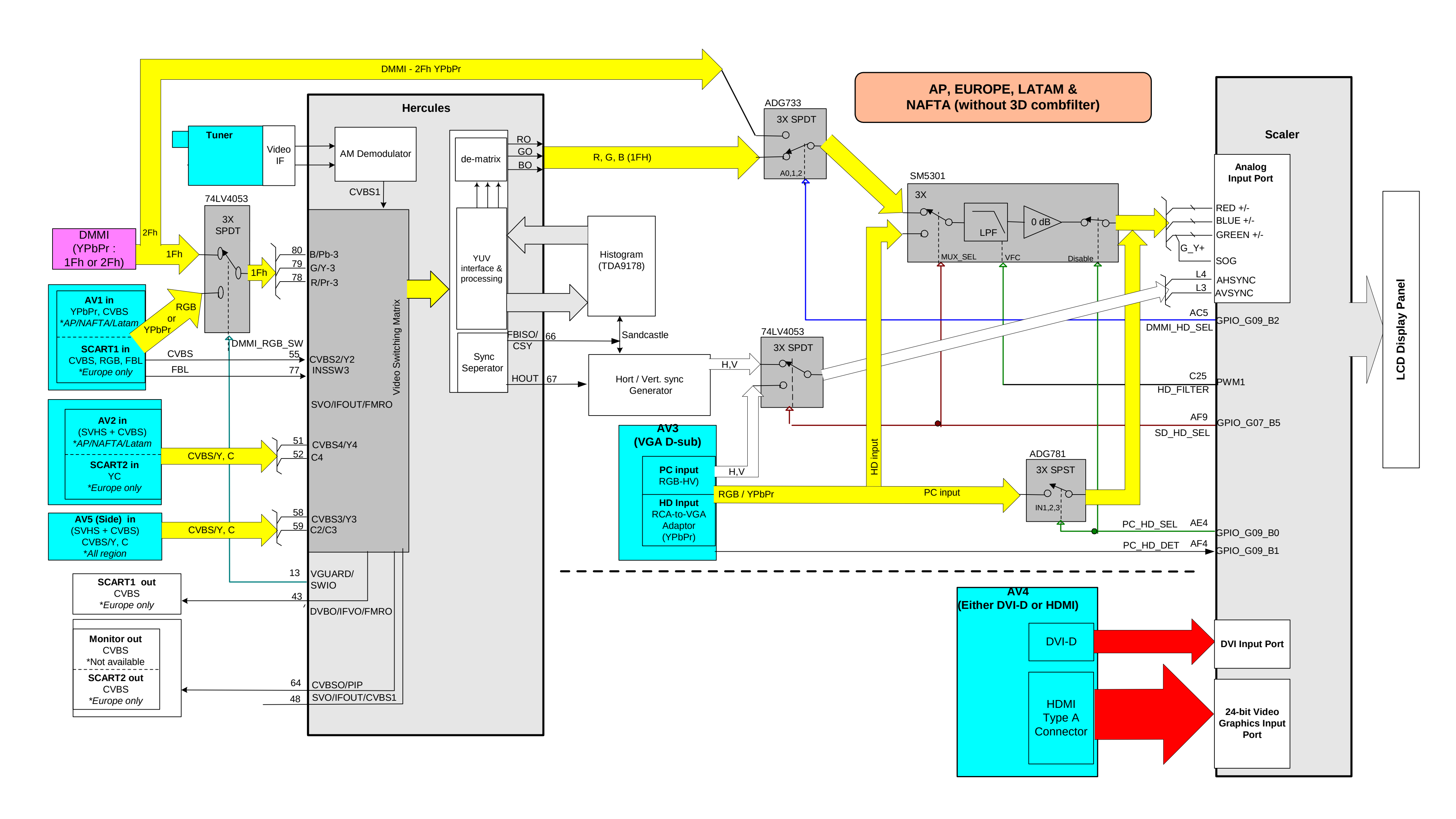
Power profile for PROTECTION mode shall be as low as required to allow “soft” diagnostics, error detection and to indicate LED flashes to flag the type of fault. The LCD panel shall be OFF in this mode. From the protection mode the only possible transition is to “OFF” mode.

STANDBY Mode (Sleep)

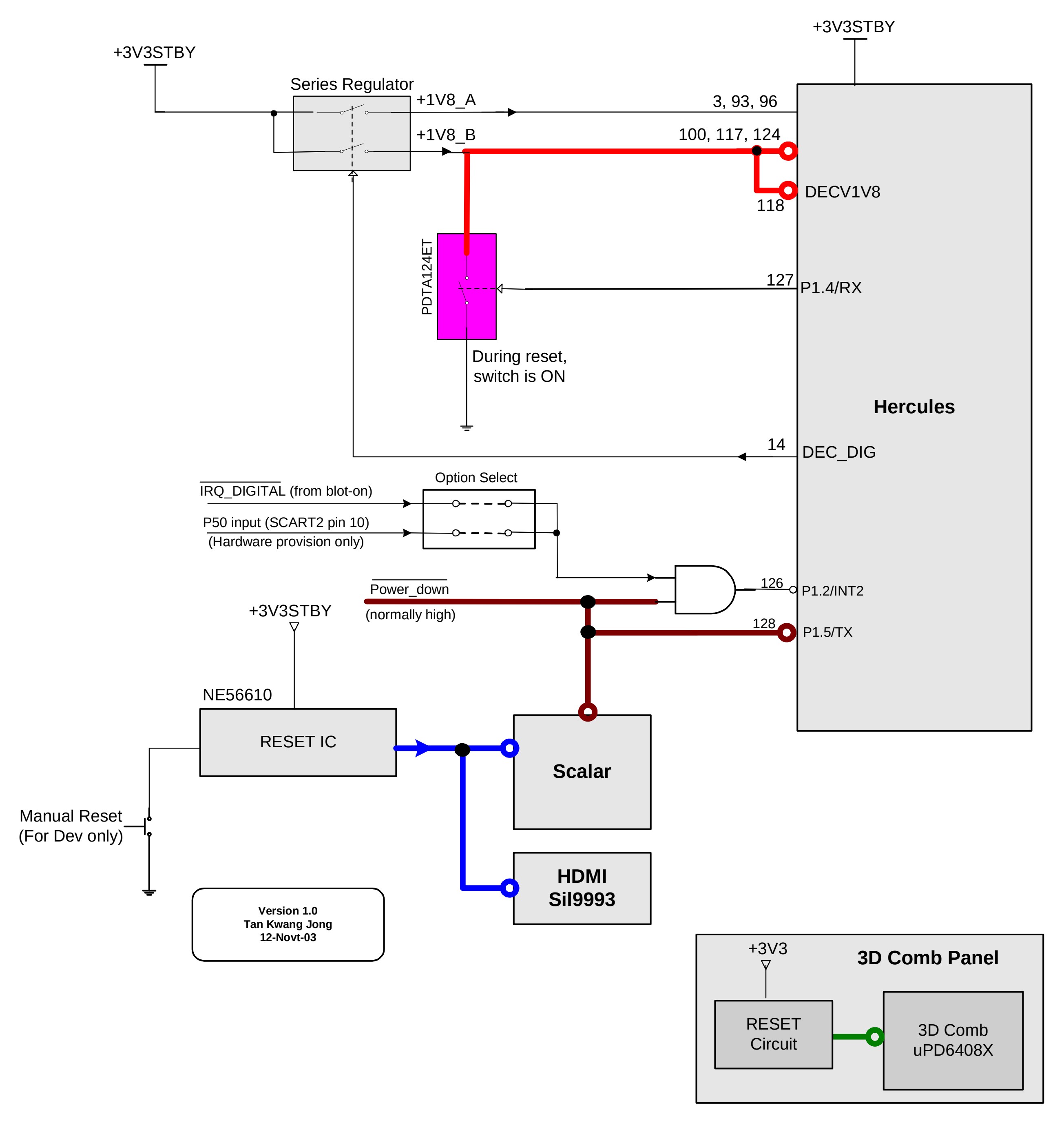
Name	Description
Power SLEEP mode	Power supplies status in set STANDBY mode

Similar to STANDBY (Normal) mode except that the system can only transit from this mode to PC-ON mode via VESA power management (DPMS) or DVI Digital Monitor Power Management (DVI-DMPM). However, if user selects TV (including wake-up keys), FM or HD mode via the remote controller, the system can transit out from PC-Sleep to the selected mode.
In this mode the UOCIII, Scaler and peripherals shall be set to the lowest power consumption mode by software when appropriate.


Hercules
Tuner
SIF
FM
SIF Input
SSIF Input
AV1 in
*AP/USA/Latam
SCART1 in
*Europe only
AUDIO-IN5L
AUDIO-IN5R
Is used on the DMMI
=> No SCART2/AV2 for
Bolt-on
AV2 in
*AP/USA/Latam
SCART2 in
*Europe only
AUDIO-IN3L
AUDIO-IN3R
Side in
*All region
AUDIOI-N4L
AUDIO-IN4R
HEF4053
3X SPDT
PC in
HDMI
I2S
ADC
AUDIO-IN2L
AUDIO-IN2R
PC_HDMI_AUD_SEL
(From Scaler,
GPIO_G07_B0)
AUDIO-LSL
AUDIO-LSR
2x
Amplifier
2x Stereo
Speaker
Constant Level Out
*Europe only
Amplifier
Headphone
For iTV only
AUDIO-OUTHPL
AUDIO-OUTHPR
Monitor out
* Not available
SCART2 out
*Europe only
AUDIO-OUTSL
AUDIO-OUTSR
SCART1 out
*Europe only
P0.0/I2SDO1
106
P0.0/I2SDI1
105
P0.3/I2SCLK
103
Lip Sync
Circuit



Video Source Selection for All region without 3D-combfilter



Overview of System Reset

	PC Input								
Condition: Patten#1 Gray Scale pattern at PC input. 1024x768@60Hz. PC Picture setting: Brightness 100, Contrast 100, Color 50, Sharpness 50. Input Source: 1) from D-sub connector; 2) from DVI connector									
	Description	Test Location	Specs			Unit	Results	Remarks
Scaler			Min	Typ	Max			
5.1a	RED/PR Input	7606 pin 12			700	mVpp		
5.1b	RED/PR input – 3dB Bandwidth		70			MHz		
5.2a	GREEN/Y Input	7606 pin 14			700	mVpp		
5.2b	GREEN/Y input – 3dB Bandwidth		70			MHz		
5.3a	BLUE/PB Input	7606 pin 2			700	mVpp		
5.3b	BLUE/PB input – 3dB Bandwidth		70			MHz		
5.4	HS freq	7604 pin 4		48.4		kHz		
5.4a	HS level			3.3		Vpp		
5.4b	HS Tr				20	ns		
5.4c	HS Tf				20	ns		
5.4d	HS jitter				5	ns		
5.5a	VS freq	7604 pin 8			60	Hz		
5.5b	VS level			3.3		Vpp		
5.5c	VS Tr				20	ns		
5.5d	VS Tf				20	ns		

Software ID

<u>Hercules</u>

LC4.2V **AAAABBC_x.yy** (**AAAA**=chassis name, **BB**=region + function, **C**=language cluster, **x**=main version number, **yy**=sub version number)

LC42EP1_1.00
LC42UN1_1.00
LC42AP1_1.00
LC42AN1_1.00
LC42LP1_1.00

LC42EX1_1.00 **(Pixel Plus)**
LC42UX1_1.00 **(Pixel Plus)**
LC42AX1_1.00 **(Pixel Plus)**

<u>Scaler</u>

AAABBC_x.yy (**AAA**=chassis name, **BB**=region + function, **C**=language cluster, **x**=main version number, **yy**=sub version number)

S42GV1_1.00 (for LC4.2 scaler global)
S42GTD_1.00 (for LC4.2 DMR scaler global, understood that the UI have to be adapted)
S42GTP_1.00 (for LC4.2 Pixel Plus scaler global)

(where S42=Scaler SW version of LC4.2, G=Global, V= Value, T=Top, D=DMR, P=Pixel Plus, 1=not used at this moment as not region dependent)

Note: we assumed no change in Hercules sw for DMR & Pixel Plus set.

<u>Hercules</u>

LC4.1 **AAAABBC_x.yy** (**AAAA**=chassis name, **BB**=region + function, **C**=language cluster, **x**=main version number, **yy**=sub version number)

LC41EP1_1.00 (Western Europe)
LC41EP2_1.00 (Eastern Europe)
LC41UN1_1.00
LC41AP1_1.00
LC41AN1_1.00
LC41LP1_1.00

(where LC41=LC4.1, E/U/A/L= regions, P=PAL/PAL-NM/PAL-Multi, N=NTSC)

<u>Scaler</u>

AAABBC_x.yy (**AAA**=chassis name, **BB**=region + function, **C**=language cluster, **x**=main version number, **yy**=sub version number)

S41EV1-1.00	**(for Scaler (1) West Eu VGA)**
S41EV2-1.00	**(for Scaler (2) East Eu VGA)**
S41RV1-1.00	**(for Scaler RoW VGA)**
S41EX1-1.00	**(for Scaler (1) West Eu XGA)**
S41EX2-1.00	**(for Scaler (2) East Eu XGA)**
S41RX1-1.00	**(for Scaler RoW XGA)**

(S41=Scaler SW version of LC4.1, E=Eu, R=Rest of the world, V=VGA, X=XGA, 1=West Eu in combination with region Europe, 2=East Eu in combination with region Europe (in case region is R=rest of world then language cluster 1 has no meaning))